

Monroe County Hazard Mitigation Plan 2023 Update



Volume I

March 2023





TABLE OF CONTENTS

Volume I			
SECTION 1.	INTRO	ODUCTION	1
SECTION 2.	PLAN	ADOPTION	2-1
SECTION 3.	PLAN	NING PROCESS	3-1
	3.1	INTRODUCTION	3-1
	3.2	ORGANIZATION OF PLANNING PROCESS	3-2
	3.3	STAKEHOLDER OUTREACH AND INVOLVEMENT	3-8
	3.4	INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND	
		TECHNICAL INFORMATION	3-23
	3.5	INTEGRATION WITH EXISTING PLANNING MECHANISMS AND	
		PROGRAMS	
	3.6	CONTINUED PUBLIC INVOLVEMENT	
SECTION 4.	COUN	TY PROFILE	4-1
	4.1	GENERAL INFORMATION	
	4.2	POPULATION AND DEMOGRAPHICS	4-16
	4.3	GENERAL BUILDING STOCK	
	4.4	LAND USE AND POPULATION TRENDS	
	4.6	LIFELINES AND CRITICAL FACILITIES	4-29
SECTION 5.	RISH	K ASSESSMENT	5-1
	5.1	METHODOLOGY AND TOOLS	5.1-1
	5.2	IDENTIFICATION OF HAZARDS OF CONCERN	5.2-1
	5.3	HAZARD RANKING	5.3-1
	5.4	HAZARD PROFILES	5.4-1
		5.4.1 Disease Outbreak	5.4.1-1
		5.4.2 Drought	5.4.2-1
		5.4.3 Earthquake	5.4.3-1
		5.4.4 Extreme Temperature	5.4.4-1
		5.4.5 Flood	
		5.4.6 Hazardous Materials	
		5.4.7 Infestation and Invasive Species	
		5.4.8 Landslide	
		5.4.9 Severe Storm	
		5.4.10 Severe Winter Storm	
		5.4.11 Wildfire	3.4.11-1
SECTION 6.	MITIC	GATION STRATEGIES	
	6.1	BACKGROUND AND PAST MITIGATION ACCOMPLISHMENTS	
	6.2	GENERAL MITIGATION PLANNING APPROACH	
	6.3	REVIEW AND UPDATE OF MITIGATION GOALS AND OBJECTIVES.	-
	6.4	CAPABILITY ASSESSMENT	
	6.5	MITIGATION STRATEGY DEVELOPMENT AND UPDATE	6-33
SECTION 7.	PLAN	MAINTENANCE PROCEDURES	7-1





Acronyms and Abbreviations	AC-1
References	

Appendices

Appendix A	Adoptions	

- Appendix B Meeting Documentation
- Appendix C Public and Stakeholder Outreach
- Appendix D Participation Matrix
- Appendix E Action Worksheet Template
- Appendix F Plan Maintenance Tools
- Appendix G Critical Facility Inventory
- Appendix H Risk Assessment Supplement
- Appendix I NYSDHSES Planning Standards
- Appendix J Linkage Procedures
- Appendix K Dam Supplementary





Volume II

SECTION 8. PLANN	NING PARTNERSHIP	8-1
SECTION 9. JURIS	DICTIONAL ANNEXES	
9.1	MONROE COUNTY	
9.2	TOWN OF BRIGHTON	
9.3	VILLAGE OF BROCKPORT	
	TOWN OF CHILI	
9.5	VILLAGE OF CHURCHVILLE	

9.6	TOWN OF CLARKSON
9.7	TOWN VILLAGE OF EAST ROCHESTER
9.8	VILLAGE OF FAIRPORT
9.9	TOWN OF GATES9.9-1
9.10	TOWN OF GREECE
9.11	TOWN OF HAMLIN9.11-1
9.12	TOWN OF HENRIETTA
9.13	VILLAGE OF HILTON
9.14	VILLAGE OF HONEOYE FALLS
9.15	TOWN OF IRONDEQUOIT
9.16	TOWN OF MENDON
9.17	TOWN OF OGDEN
9.18	TOWN OF PARMA
9.19	TOWN OF PENFIELD9.19-1
9.20	TOWN OF PERINTON9.20-1
9.21	TOWN OF PITTSFORD9.21-1
9.22	VILLAGE OF PITTSFORD9.22-1
9.23	TOWN OF RIGA9.23-1
9.24	CITY OF ROCHESTER
9.25	TOWN OF RUSH
9.26	VILLAGE OF SCOTTSVILLE
9.27	VILLAGE OF SPENCERPORT9.27-1
9.28	TOWN OF SWEDEN
9.29	TOWN OF WEBSTER9.29-1
9.30	VILLAGE OF WEBSTER9.30-1
9.31	TOWN OF WHEATLAND





Section 1. Introduction

1.1 BACKGROUND

Communities, residents, and businesses have been faced with continually increasing costs associated with both natural and man-made hazards. Hazard mitigation is the first step in reducing risk and is the most effective way to reduce costs associated with hazards. Monroe County and 30 participating jurisdictions located therein, have developed this Monroe County Hazard Mitigation Plan (MCHMP, also referred herein as the "Hazard Mitigation Plan" or the "plan"), which is a multi-jurisdictional, multi-hazard mitigation plan. The MCHMP includes countywide analysis and assessment of hazards, risk and capabilities and represents an update of the 2017 "Monroe County Hazard Mitigation Plan." The plan has been prepared following the requirements of the federal Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 amends the Stafford Act and is designed to improve planning for, response to, and recovery from, disasters by requiring state and local entities to implement pre-disaster mitigation planning and develop HMPs. The Federal Emergency Management Agency (FEMA) has issued guidelines for the development of multi-jurisdictional hazard mitigation plans, and the New York State Division of Homeland Security and Emergency Services (DHSES) also supports plan development for jurisdictions in New York State.

Hazard Mitigation is any sustained action taken to reduce or eliminate the long-term risk and effects that can result from specific hazards.

FEMA defines a Hazard Mitigation Plan as the documentation of a state or local government evaluation of natural hazards and the strategies to mitigate such hazards.

Specifically, DMA 2000 requires that states, with support from local governmental agencies, update

Monroe County has been included in 21 FEMA (major and emergency) declarations since 1954. HMPs on a 5-year basis to prepare for and reduce the potential impacts of natural hazards. DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. This enhanced planning process will better enable local and state governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

1.1.1 DMA 2000 Origins -The Robert T. Stafford Disaster Relief and Emergency Assistance Act

The Federal Emergency Management Agency (FEMA) estimates that for every dollar spent on damage prevention (mitigation), twice that amount is saved by not having to perform post-disaster repairs. In the early 1990s, a new federal policy regarding disasters began to evolve. Rather than simply reacting whenever disasters strike communities, the federal government began encouraging communities to first assess their vulnerability to various disasters and proceed to take actions to reduce or eliminate potential risks. The policy is based on the logic that a disaster-resistant community can rebound from a natural disaster with less loss of property or human injury, at much lower cost and, consequently, more quickly. Moreover, other costs associated with disasters are minimized, such as the time lost from productive activity by business and industries.

DMA 2000 provides an opportunity for states, tribes, and local governments to take a new and revitalized approach to mitigation planning. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions (Section 409) and replacing them with a new set of requirements (Section 322). Section 322 sets forth the requirements that communities evaluate natural hazards within their respective jurisdictions and develop





an appropriate plan of action to mitigate those hazards, while emphasizing the need for state, tribal, and local governments to closely coordinate mitigation planning and implementation efforts.

The amended Stafford Act requires that each local jurisdiction identify potential natural hazards to the health, safety, and well-being of its residents, and identify and prioritize actions that can be taken by the community to mitigate those hazards before disaster strikes. For communities to remain eligible for hazard mitigation assistance from the federal government, they must first prepare, and then maintain and update an HMP.

Responsibility for fulfilling the requirements of Section 322 of the Stafford Act and administering the FEMA Hazard Mitigation Program has been delegated to the State of New York, specifically to NYS DHSES. FEMA also provides support through guidance, resources, and plan reviews.

1.1.2 Benefits of Mitigation Planning

Effective mitigation planning will help prepare citizens and government agencies to better prepare for and respond when disasters occur. Also, mitigation planning allows Monroe County as a whole, including the participating Monroe County city, towns, and villages, to remain eligible for mitigation grant funding for mitigation projects that will reduce the impact of future disaster events. The long-term benefits of mitigation planning and implementation include:

• An increased understanding of hazards faced by Monroe County communities

	I Benefit-Cost Ratio (BCR) Per Peril numbers in this study have been rounded Overall Hazard Benefit-Cost Ratio	Beyond Code Requirements \$4:1	Federally Funded \$6:1
	Riverine Flood	\$5:1	\$7:1
	Hurricane Surge	\$7:1	Too few grants
*	Wind	\$5:1	\$5:1
	Earthquake	\$4:1	\$3:1
12	Wildland-Urban Interface Fire	\$4:1	\$3:1

Source: FEMA 2018; Federal Insurance Mitigation Administration 2018 Note: Natural hazard mitigation saves \$6 on average for every \$1 spent on federal mitigation grants.

- A more sustainable and disaster-resistant community
- Financial savings through partnerships that support planning and mitigation efforts
- Focused use of limited resources on hazards that have the biggest impact on the community
- Reduced long-term impacts and damages to human health and structures
- Reduced costs associated with response and recovery efforts, including repairs

1.1.3 Organizations Involved in the Mitigation Planning Effort

Monroe County and the participating jurisdictions have prepared this hazard mitigation plan with full coordination and participation of county and local government, relevant organizations and groups, as well as state and federal agencies and the general public. Coordination helps to ensure that stakeholders have established communication channels and relationships necessary to support mitigation planning and mitigation actions included in Section 6 and in the jurisdictional annexes in Section 9. Including Monroe County, all 30 of the municipal governments in the County have participated in the planning process as indicated in Table 1-1 below.

Table 1-1. Participating Jurisdictions in Monroe County

Jurisdictions			
Monroe County	Town of Henrietta	Town of Riga	





Jurisdictions			
Town of Brighton	Village of Hilton	City of Rochester	
Village of Brockport	Village of Honeoye Falls	Town of Rush	
Town of Chili	Town of Irondequoit	Village of Scottsville	
Village of Churchville	Town of Mendon	Village of Spencerport	
Town of Clarkson	Town of Ogden	Town of Sweden	
Town/Village of East Rochester	Town of Parma	Town of Webster	
Village of Fairport	Town of Penfield	Village of Webster	
Town of Gates	Town of Perinton	Town of Wheatland	
Town of Greece	Town of Pittsford	-	
Town of Hamlin	Village of Pittsford	-	

Multiple Agency Support for Hazard Mitigation

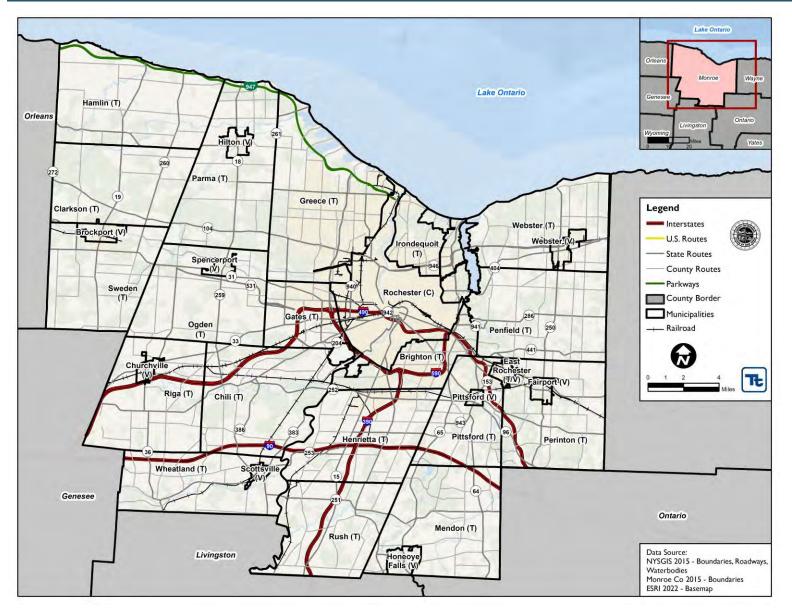
Primary responsibility for the development and implementation of mitigation strategies and policies lies with local governments. However, local governments are not alone; various partners and resources at the regional, state, and federal levels are available to assist communities in the development and implementation of mitigation strategies. Within New York State, NYS DHSES is the lead agency providing hazard mitigation planning assistance to local jurisdictions. In addition, FEMA provides grants, tools, guidance, and training to support mitigation planning.

Additional input and support for this planning effort was obtained from a wide range of agencies as well as through public involvement (as discussed in Section 3). Under the project management of the Monroe County Office of Emergency Management (OEM), the Monroe County Hazard Mitigation Steering Committee provided oversight for the preparation of this plan. Details regarding the roles and responsibilities of the Steering Committee and Planning Committee are further discussed in Section 3. The Steering Committee includes representatives from the Monroe County Office of Emergency Management, Department of Environmental Services, Geographic Information System Services, Rochester-Genesee Regional Transportation Authority (RGTA), Monroe County Soil & Water Conservation District, Monroe County School Superintendents, Monroe Community College, University of Rochester, City of Rochester, and Town of Irondequoit. The 30 participating municipalities provided significant input into the preparation of the plan, in particular the preparation of the annexes included in Section 9 for each municipality. Details regarding the roles and responsibilities of the various committees and other participants are further discussed in Section 3.













This hazard mitigation plan was prepared in accordance with the following regulations and guidance:

- FEMA Local Mitigation Planning Policy Guide, April 19, 2022.
- FEMA Local Mitigation Planning Handbook, March 2013.
- FEMA Integrating Hazard Mitigation into Local Planning, March 1, 2013.
- FEMA Plan Integration: Linking Local Planning Efforts, July 2015.
- Local Mitigation Plan Review Guide, October 1, 2011.
- DMA 2000 (Public Law 106-390, October 30, 2000).
- 44 Code of Federal Regulations (CFR) Parts 201 and 206 (including: Feb. 26, 2002, Oct. 1, 2002, Oct. 28, 2003, and Sept. 13, 2004 Interim Final Rules).
- FEMA *How-To Guide for Using HAZUS-MH for Risk Assessment* FEMA Document No. 433, February 2004.
- FEMA *Mitigation Planning How-to Series* (FEMA 386-1 through 4, 2002), available at: <u>http://www.fema.gov/fima/planhowto.shtm</u>
- FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards, January 2013.
- NYS DHSES Hazard Mitigation Planning Standard, 2017.
- NYS DHSES Hazard Mitigation Plan

Table 1-2 summarizes the requirements outlined in the DMA 2000 Interim Final Rule and where each of these requirements is addressed in this hazard mitigation plan.

Table 1-2. FEMA Local Mitigation Plan Review Crosswalk

Plan Criteria	Primary Location in Plan		
Prerequisites			
Adoption by the Local Governing Body: §201.6(c)(5)	Section 2.0; Appendix A		
Planning Process			
Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)	Section 3.0		
Risk Assessment			
Identifying Hazards: §201.6(c)(2)(i)	Sections 5.2		
Profiling Hazards: §201.6(c)(2)(i)	Section 5.4		
Assessing Vulnerability: Overview: §201.6(c)(2)(ii)	Section 5.4		
Assessing Vulnerability: Identifying Structures: §201.6(c)(2)(ii)(A)	Section 4.0 Section 5.4		
Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)	Section 5.4		
Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)	Section 4.0; Section 9 Annexes		
Mitigation Strategy			
Local Hazard Mitigation Goals: §201.6(c)(3)(i)	Section 6.0; Section 9 Annexes		
Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)	Section 6.0; Section 9 Annexes		
Implementation of Mitigation Actions: §201.6(c)(3)(iii)	Section 6.0; Section 9 Annexes		
Multi-Jurisdictional Mitigation Actions: : §201.6(c)(3)(iv)	Section 6.0; Section 9 Annexes		
Plan Maintenance Process			
Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(i)	Section 7.0		
Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)	Section 7.0; Section 9 Annexes		
Continued Public Involvement: §201.6(c)(4)(iii)	Section 7.0		





Organization

The Monroe County Hazard Mitigation Plan has been organized into a two-volume plan to facilitate use of this plan as a resource for each participant. The plan provides a detailed review and analysis of each hazard of concern, resources, and relevant statistical information for Monroe County and participating municipalities.

Volume I is intended for use as a resource for on-going mitigation analysis. It includes a description of the county and local municipalities as well as information on mitigation planning and how the risk assessment and capability analysis was performed. Volume II consists of an annex dedicated to each participating jurisdiction. Each annex summarizes the jurisdiction's legal, regulatory, and fiscal capabilities; evaluates vulnerabilities to natural hazards; describes the status of past mitigation actions; and provides specific mitigation strategies. The annexes are intended to provide an expedient resource for each jurisdiction for implementation of mitigation projects and maximizing future grant opportunities.

Hazard Mitigation Plan Goals and Objectives

According to CFR 201.6(c)(3)(i): "The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards." The mitigation goals have been developed based on the risk assessment results, discussions, research, and input from amongst the committee, existing authorities, polices, programs, resources, stakeholders, and the public.

The Monroe County Hazard Mitigation Plan planning process included a review and update of the prior mitigation goals and objectives as a basis for the planning process and to guide the selection of appropriate mitigation actions addressing all hazards of concern. Further, the goal development process considered the mitigation goals expressed in the New York State HMP, as well as other relevant county and local planning documents, as discussed in Section 6 (Mitigation Strategy).

2023 Monroe County Hazard Mitigation Plan Goals

Goal 1: Coordinate hazard mitigation programs and other planning efforts that affect the County.

Goal 2: Prevent hazards from negatively impacting new development.

Goal 3: Protect life, property, and the environment from current and future hazard impacts.

Goal 4: Increase public awareness of current and future hazards, their impacts, and ways to reduce vulnerability through education and outreach.

Goal 5: Protect, preserve, and restore the functions of natural systems.

Hazards of Concern

Monroe County and participating jurisdictions reviewed the natural hazards that caused measurable impacts based on events, losses, and information available since the development of the current Monroe County HMP (2017). Monroe County and participating jurisdictions evaluated the risk and vulnerability due to each of the hazards of concern on the assets of each participating jurisdiction. Although the resulting hazard risk rankings varied for each jurisdiction, the summary risk rankings corresponded with that of Monroe County and are indicated in each jurisdictional annex. The hazard risk ranks were used to focus and prioritize individual jurisdictional mitigation strategies.

Monroe County HMP Hazards of Concern

Disease Outbreak Drought Earthquake Extreme Temperature Flood Hazardous Materials Infestation and Invasive Species Severe Storm Severe Winter Storm Wildfire





Plan Integration into Other Planning Mechanisms

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the County there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate, complement, and reference those plans and programs to the extent practical in order to be a comprehensive resource for hazard mitigation.

The "Capability Assessment" section of Chapter 6 (Mitigation Strategy) provides a summary and description of the existing plans, programs, and regulatory mechanisms at all levels of government (Federal, State, County and local) that support hazard mitigation within the County. Within each jurisdictional annex in Chapter 9, the County and each participating jurisdiction have identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework, and how they intend to continue to promote this integration. A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7.

1.1.4 Implementation of the 2017 Plan

The status of the mitigation projects identified in prior or existing local HMPS are provided in Section 6 (Mitigation Strategy) and Section 9 (Jurisdictional Annexes) of the plan. Numerous projects and programs have been implemented that have reduced hazard vulnerability to assets in the planning area. Those projects not completed have been revaluated, modified as necessary and incorporated into this plan. The County and municipal annexes describe these mitigation activities in more detail, and plan maintenance procedures (Section 7) have been developed to encourage thorough integration with local decisions and processes and regular review of implementation progress.

1.1.5 Implementation of the Planning Process

To support the planning process in developing this plan, Monroe County and the participating jurisdictions have accomplished the following:

- Developed a Steering Committee and countywide Planning Partnership with municipalities and stakeholders.
- Reviewed the 2017 Monroe County Hazard Mitigation Plan
- Identified and reviewed hazards of greatest concern to the community (hazards of concern) to be included in the update
- Profiled hazards of concern
- Estimated the inventory at risk and potential losses associated with these hazards
- Reviewed and updated the mitigation goals and objectives
- Reviewed mitigation strategy and actions outlined in the 2017 HMP to indicate progress
- Developed new mitigation actions to reduce the vulnerability of assets from hazards of concern
- Involved a wide range of stakeholders and the public in the plan update process
- Developed mitigation plan maintenance procedures to be executed after obtaining approval of the plan from NYS DHSES and FEMA

As required by DMA 2000, Monroe County and participating jurisdictions have informed the public and provided opportunities for public comment and input. In addition, numerous agencies and stakeholders





have participated as core or support members, providing input and expertise throughout the planning process.

This HMP Update documents the process and outcomes of the mitigation efforts of Monroe County and its jurisdictions. Additional information on the plan update process is included in Section 3, Planning Process. Documentation that the prerequisites for plan approval have been met is included in Section 2, Plan Adoption.

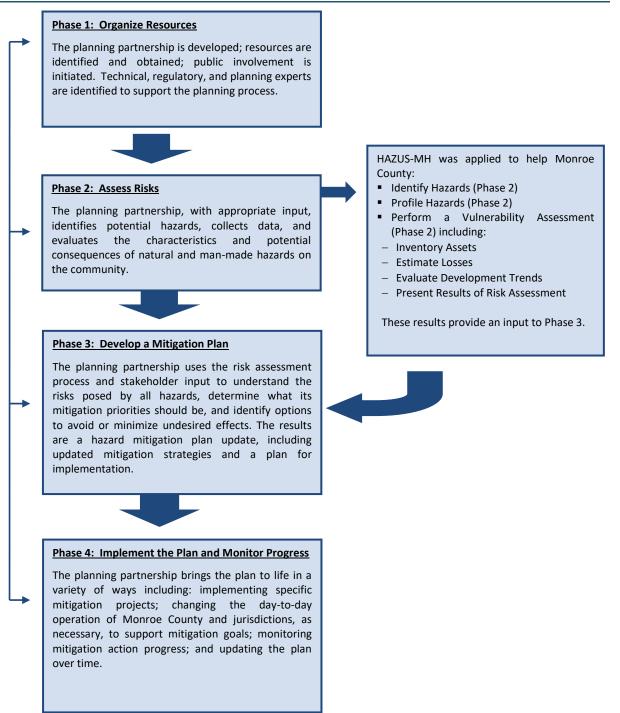
1.1.6 Organization of This Mitigation Plan

The planning effort followed the four-phase planning process recommended by FEMA and summarized in Figure 1-2.





Figure 1-2. Monroe County Hazard Mitigation Planning Process







This plan was organized in accordance with FEMA and NYS DHSES guidance, organized into two volumes: Volume I includes all information that applies to the entire planning area (Monroe County); and Volume II includes specific information for the County as a jurisdiction as well as each participating jurisdiction.

More specifically, Volume I of this plan includes the following sections:

- **Section 1:** Introduction: Overview of participants and planning process
- Section 2: Plan Adoption: Information regarding the adoption of the plan by Monroe County and each participating jurisdiction.
- Section 3: Planning Process: A description of the plan methodology and development process, committee and stakeholder roles and activities, and how the plan will be incorporated into existing programs.
- Section 4: County Profile: An overview of Monroe County, including: (1) general information and physical conditions, (2) economy, (3) land use patterns and trends, (4) population and demographics, (5) general building stock inventory and (6) critical facilities.
- Section 5: Risk Assessment: Documentation of the hazard identification and hazard risk ranking process, hazard profiles, and findings of the vulnerability assessment (estimates of the impact of hazard events on life, safety, and health; general building stock; critical facilities and the economy). Description of the status of local data and planned steps to improve local data to support mitigation planning.
- Section 6: Mitigation Strategies: Information regarding the mitigation goals and objectives identified by the Steering Committee in response to priority hazards of concern, and the process by which County and local mitigation strategies have been developed or updated.
- Section 7: Plan Maintenance Procedures: A system to continue to monitor, evaluate, maintain, and update the plan.

Volume II of this plan includes the following sections:

- Section 8: Planning Partnership: Description of the planning partnership and jurisdictional annexes.
- Section 9: Jurisdictional Annexes: A jurisdiction-specific annex for Monroe County and each participating jurisdiction containing their hazards of concern, hazard risk ranking, capability assessments, mitigation actions, action prioritization specific only to Monroe County or that jurisdiction, progress on prior mitigation activities (as applicable), and a discussion of prior local hazard mitigation plan integration into local planning processes.

Appendices include:

- **Appendix A:** Sample Resolution of Plan Adoption: Documentation that supports the plan approval signatures included in Section 2 of this plan.
- **Appendix B**: Meeting Documentation: Agendas, attendance sheets, minutes, and other documentation (as available and applicable) of planning meetings convened during the development of the plan.





- **Appendix C:** Public and Stakeholder Outreach Documentation: Documentation of the public and stakeholder outreach effort including webpages, informational materials, public and stakeholder meetings and presentations, surveys, and other methods used to receive and incorporate public and stakeholder comment and input to the plan update process.
- **Appendix D:** Participation Matrix
- Appendix E: Action Worksheet Template and Instructions
- **Appendix F:** Plan Maintenance Tools: Examples of plan review templates available to support annual plan review and example FEMA Guidance Worksheets (FEMA 386-4).
- Appendix G: Critical Facility Inventory
- **Appendix H:** Risk Assessment Supplementary Data: Details regarding past hazard events since those documented in the 2023 plan.
- **Appendix I:** NYS DHSES Planning Standards: Includes planning standards and guidelines for hazard mitigation planning.
- Appendix J: Linkage Procedures
- **Appendix K:** Dam Supplement: This appendix contains information on high hazard dams within Monroe County. Due to the sensitive nature of this information, details of the facilities have been redacted for the public document.





SECTION 2. PLAN ADOPTION

2.1 OVERVIEW

This section contains information regarding adoption of the plan by Monroe County and each participating jurisdiction.

2.1.1 Plan Adoption by Local Governing Bodies

Adoption by the local governing bodies such as the County Legislature, City Council, or Town/Village Board demonstrates the commitment of Monroe County and each participating jurisdiction to fulfill the mitigation goals and strategies outlined in the plan. Adoption of the plan via a municipal resolution legitimizes the Hazard Mitigation Plan (HMP) and authorizes responsible agencies to execute their responsibilities.

The County and all participating jurisdictions will proceed with formal adoption proceedings when the Federal Emergency Management Agency (FEMA) has completed review of the plan and provides conditional approval of this HMP update, known as Approval Pending Adoption (APA).

Following adoption or formal action on the plan, the jurisdiction must submit a copy of the resolution or other legal instrument showing formal adoption (acceptance) of the plan to the Monroe County Hazard Mitigation Coordinator in the Monroe County Office of Emergency Management. Monroe County will forward the executed resolutions to the New York State Division of Homeland Security & Emergency Services (NYS DHSES), after which they will be forwarded to FEMA for the record. The jurisdictions understand that FEMA will transmit acknowledgement of verification of formal plan adoption and the official approval of the plan to the Monroe County Hazard Mitigation Plan Coordinator.

The resolutions issued by each jurisdiction to support adoption of the plan will be included in Appendix A.

In addition to being required by DMA 2000, adoption of the plan is necessary because:

- It lends authority to the plan to serve as a guiding document for all local and state government officials.
- It gives legal status to the plan in the event it is challenged in court.
- It certifies to the program and grant administrators that the plan's recommendations have been properly considered and approved by the governing authority and jurisdictions' citizens.
- It helps to ensure the continuity of mitigation programs and policies over time because elected officials, staff, and other community decision-makers can refer to the official document when making decisions about the community's future.

Source: FEMA. 2003. How to Series: Bringing the Plan to Life (FEMA 386-4).





SECTION 3. PLANNING PROCESS

3.1 Introduction

This section includes a description of the planning process used to update the Monroe County Hazard Mitigation Plan (also referred herein as the "Hazard Mitigation Plan" or the "plan"), including how it was prepared, who was involved in the process, and how the public was involved.

To ensure that the plan both met the requirements of the DMA 2000, as well as to support the long-term goal of having all jurisdictions in the County covered under a comprehensive and cohesive county-wide DMA 2000 plan, an approach to the planning process and plan documentation was developed to achieve the following:

• The plan will be multi-jurisdictional, with the intention of including all municipalities in the County. Monroe County invited all jurisdictions in the county to join with them in the planning process. To date, all of the 30 local municipal governments in the County have participated in the 2023 plan update process as indicated in Table 3-1 below. The format of this plan is such that other entities can readily join in the regulatory 5-year plan update process, as identified in Section 7 (Plan Maintenance).

Jurisdictions				
Monroe County	Town of Henrietta	Town of Riga		
Town of Brighton	Village of Hilton	City of Rochester		
Village of Brockport	Village of Honeoye Falls	Town of Rush		
Town of Chili	Town of Irondequoit	Village of Scottsville		
Village of Churchville	Town of Mendon	Village of Spencerport		
Town of Clarkson	Town of Ogden	Town of Sweden		
Town/Village of East Rochester	Town of Parma	Town of Webster		
Village of Fairport	Town of Penfield	Village of Webster		
Town of Gates	Town of Perinton	Town of Wheatland		
Town of Greece	Town of Pittsford	-		
Town of Hamlin	Village of Pittsford	-		

Table 3-1. Participating Monroe County Jurisdictions

- The plan considers all-natural hazards facing the area, thereby satisfying the natural hazards mitigation planning requirements specified in DMA 2000. In addition, non-natural hazards that pose significant risk were considered as well.
- The plan was developed following the process outlined by DMA 2000, FEMA regulations, and prevailing FEMA and NYS DHSES guidance. Following this process ensures that all the requirements are met and support Plan review. In addition, this plan will meet criteria for the National Flood Insurance Program (NFIP) Community Rating System (CRS) and the Flood Mitigation Assistance (FMA) programs.

The Monroe County HMP update was written using the best available information obtained from a wide variety of sources. Throughout the HMP update process, a concerted effort was made to gather information from municipal and regional agencies and staff as well as stakeholders, federal and state agencies, and the residents of the county. The HMP Steering Committee solicited information from local agencies and individuals with specific knowledge of certain natural hazards and past historical events. In addition, the Steering Committee and Planning Partnership took into consideration planning and zoning codes, ordinances, and recent land use



planning decisions. The hazard mitigation strategies identified in this HMP have been developed through an extensive planning process involving local, county and regional agencies, residents, and stakeholders.

This section of the plan describes the mitigation planning process, including (1) Organization of Planning Process; (2) Planning Activities; (3) Stakeholder Outreach and Involvement; (4) Public Outreach and Involvement; (4) Integration of Existing Data, Plans, and Information; (5) Integration with Existing Planning Mechanisms and Programs; and (6) Continued Public Outreach.

3.2 Organization of Planning Process

This section of the plan identifies how the planning process was organized with the many planning partners involved and outlines the major activities that were conducted in the development of this HMP.

3.2.1 Organization of Planning Partnership

Monroe County applied for and was awarded a multi-jurisdictional planning grant under the Building Resilient Infrastructure and Communities (BRIC) grant program (EMN-2020-BR-063-0007), which has supported the development of this HMP.

Project management and grant administration has been the responsibility of the Monroe County Department of Public Safety – Office of Emergency Management. A contract planning consultant (Tetra Tech) was tasked with:

- Assisting with the organization of a Steering Committee and municipal Planning Partnership;
- Assisting with the development and implementation of a public and stakeholder outreach program;
- Data collection;
- Facilitation and attendance at meetings (Steering Committee, municipal, stakeholder, public and other);
- Review and update of the hazards of concern, and hazard profiling and risk assessment;
- Assistance with the review and update of mitigation planning goals and objectives;
- Assistance with the review of past mitigation strategies progress;
- Assistance with the screening of mitigation actions and the identification of appropriate actions;
- Assistance with the prioritization of mitigation actions; and
- Authoring of the draft and final plan documents.

In July 2022, the County notified all municipalities within the County of the pending planning process and invited them to formally participate. Jurisdictions were asked to formally notify the county of their intent to participate (via a Letter of Intent) and to identify planning points of contact to facilitate municipal participation and represent the interests of their respective communities.

To facilitate plan development, Monroe County developed a Steering Committee to provide guidance and direction to the HMP update effort, and to ensure the resulting document will be embraced both politically and by the constituency within the planning area. Specifically, the Steering Committee was charged with:

- Providing guidance and oversight of the planning process on behalf of the general planning partnership;
- Attending and participating in Steering Committee meetings;
- Assisting with the development and completion of certain planning elements, including:
 - o Reviewing and updating the hazards of concern,
 - o Developing a public and stakeholder outreach program,
 - o Assuring that the data and information used in the plan update process is the best available
 - o Reviewing and updating the hazard mitigation goals,
 - o Identification and screening of appropriate mitigation strategies and activities; and





• Reviewing and commenting on plan documents prior to submission to NYS DHSES and FEMA.

The Steering Committee provided guidance and leadership, oversight of the planning process, and acted as the point of contact for all participating jurisdictions and the various interest groups in the planning area. Table 3-2 presents the members of the Steering Committee.

Affiliation	Name	Title
Monroe County Department of Public Safety	Matthew Jarrett	Office of Emergency Management
Monroe County Department of Public Safety	Elisabeth Clower	Office of Emergency Management
Monroe County Department of Environmental Services	Clement Chung	Deputy Director
Monroe County Department of Planning and Development	Rochelle Bell	Senior Associate Planner
Monroe County Geographic Information System (GIS) Services Division	Scott McCarty	Operations Manager
Rochester-Genesee Regional Transportation Authority (RGRTA)	Bill J. Carpenter	Chief Executive Officer
Monroe County Soil & Water Conservation District	Kelly Emerick	Executive Director
Monroe County School Superintendents	Dr. Casey Kosiorek	Hilton Superintendent
Monroe Community College in Brighton	Chuck DiSalvo	Public Safety - Coordinator, Strategic Planning
University of Rochester	Dr. John Kessler	Earth and Environmental Sciences, Chair
City of Rochester Fire Department	Jamie Renner	City of Rochester Fire Department, Captain
City of Rochester Emergency Management Office	Karen St. Aubin	City of Rochester Emergency Management
Town of Irondequoit	Erin Magee	Deputy Commissioner of Public Works
Town of Henrietta	Steve Schultz	Town Supervisor

All municipalities in the County were invited to participate in the planning process. It is noted that the Steering Committee members also are part of the overall project Planning Partnership, fulfilling these responsibilities on behalf of Monroe County. This Planning Partnership was charged with the following:

- Representing their jurisdiction throughout the planning process
- Ensuring participation of all departments and functions within their jurisdiction that have a stake in mitigation (e.g., planning, engineering, code enforcement, police and emergency services, public works)
- Assisting in gathering information for inclusion in the HMP update, including the use of previously developed reports and data
- Supporting and promoting the public involvement process
- Reporting on progress of mitigation actions identified in prior or existing HMPs, as applicable
- Identifying, developing, and prioritizing appropriate mitigation initiatives
- Reporting on progress of integration of prior or existing HMPs into other planning processes and municipal operations
- Supporting and developing a jurisdictional annex
- Reviewing, amending, and approving all sections of the plan update
- Adopting, implementing, and maintaining the plan update

Table 3-3 shows the current members of the Planning Partnership as of the time of publication of this plan update.





Jurisdiction	Primary Point of Contact	Title	Alternate Point of Contact	Title
Monroe County	Matthew Jarrett	Office of Emergency Management	Elisabeth Clower	Office of Emergency Management
Town of Brighton	Michael Guyon	Commissioner of Public Works	Chad Roscoe	Junior Engineer
Village of Brockport	Erica Linden	Manager	Dan Verace	Superintendent of Public Works
Town of Chili	Dawn Forte	Secretary to Town Supervisor	David Lindsey	Commissioner of Public Works
Village of Churchville	John Hartman	Mayor	Stacy Stanton	Clerk/Treasurer
Town of Clarkson	Kevin Moore	Building Inspector/ Code Enforcement Officer	Christa Filipowicz	Supervisor
Town/Village of East Rochester	Martin D' Ambrose	Village Administrator	William Marr	Public Works
Village of Fairport	Bryan White	Village Manager's Office	Jill Wiedrick	Planner
Town of Gates	Cosmo A. Giunta	Town Supervisor	Kurt Rappazzo	Director of Public Works and Highways
Town of Greece	Kirk Morris	DPW Commissioner	Matthew Trau	Junior Engineer
Town of Hamlin	Bernard Maier	Fire Marshall	Cheryl Pacelli	Building Inspector
Town of Henrietta	Tim Lessing	Superintendent of Highways	Steve Schultz	Supervisor
Village of Hilton	Mark Mazzucco	Code Enforcement Officer	Jeff Pearce	DPW Superintendent
Village of Honeoye Falls	Richard Milne	Mayor	Brian Anderson	Village Administrator
Town of Irondequoit	Erin Magee	PW Commissioner	Thomas Alber	Emergency Manager
Town of Mendon	John Moffitt	Supervisor	Corey Gates	Building Inspector/Code Enforcement
Town of Ogden	Mike Zale	Town Supervisor	Sue Duggan	Assistant Building Inspector
Town of Parma	Mark Lenzi	Building Inspector	Allen Reitz	Fire Marshal
Town of Penfield	Jeff David	Fire Marshal/Building Department	Mark Valentine	Town Engineer
Town of Perinton	Eric Williams	Assistant to the Commissioner of Public Works	Greg Seigfred	Director of Building and Codes/Department of Public Works
Town of Pittsford	Salvatore Tantalo	Emergency Manager / Fire Marshal	Paul Schenkel	Commissioner of Public Works
Village of Pittsford	Steven Lauth	Building Inspector/CEO/Fire Marshall	Zack Bleier	DPW Superintendent
Town of Riga	Debbie Campanella	Town Councilperson	Brad O'Brocta	Town Supervisor
City of Rochester	Mark Hudson	Deputy Fire Chief	Captain Jamie Renner	Rochester Fire Department, Special Operations Unit
Town of Rush	Gerald Kusse	Town Supervisor	Doug Scarson	Code Enforcement Officer
Village of Scottsville	Maggie Ridge	Mayor	Anne Hartman	Village Clerk
Village of Spencerport	Gary Pender	Mayor	Jackier Sullivan	Village Clerk
Town of Sweden	Kevin Johnson	Supervisor	Patricia Hayles	Deputy Supervisor
Town of Webster	Andrew Vorndran	Fire Marshal/Community Development	Mary Herington	Town Engineer

Table 3-3. Monroe County Hazard Mitigation Planning Partnership Members





Jurisdiction	Primary Point of Contact	Title	Alternate Point of Contact	Title
Village of Webster	Jake Swingly	Superintendent of Public Works	Darrell Byerts	Mayor
Town of Wheatland	Jay Coates	Fire Marshal	Linda Dobson	Town Supervisor

The various jurisdictions in Monroe County have differing levels of capabilities and resources available to apply to the plan update process, and further, have differing exposure and vulnerability to the natural hazard risks being considered in this plan. It was Monroe County's intent to encourage participation by all-inclusive jurisdictions, and to accommodate their specific needs and limitations while still meeting the intents and purpose of plan update participation. Such accommodations have included the establishment of a Steering Committee, engaging a contract consultant to assume certain elements of the plan update process on behalf of the jurisdictions, and the provision of additional and alternative mechanisms to meet the purposes and intent of mitigation planning.

Ultimately, jurisdictional participation is evidenced by a completed annex of the HMP wherein jurisdictions have individually identified their planning points of contact, evaluated their risk to the hazards of concern, identified their capabilities to effect mitigation in their community, and identified and prioritized an appropriate suite of mitigation initiatives, actions, and projects to mitigate their hazard risk; and eventually, by the adoption of the updated plan via resolution. Refer to Section 9 of this HMP.

Appendix D (Participation Matrix) identifies those individuals who represented the municipalities during this planning effort and indicates how they contributed to the planning process.

It is noted that all municipalities in the County actively participate in the National Flood Insurance Program and have a designated NFIP Floodplain Administrator (FPA). All FPAs have been informed of the planning process, reviewed the plan documents, and provided direct input to the plan update. Local FPAs are identified as part of the Hazard Mitigation Planning Team presented within each of the jurisdictional annexes in Section 9, as well as in Appendix D (Participation Matrix).

3.2.2 Planning Activities

Members of the Planning Partnership (individually and as a whole), as well as key stakeholders, convened and/or communicated on an as-needed basis to share information and participate in workshops to identify hazards; assess risks; review existing inventories of and identify new critical facilities; assist in updating and developing new mitigation goals and strategies; and provide continuity through the process to ensure that natural hazards vulnerability information and appropriate mitigation strategies were incorporated. All members of the Planning Partnership had the opportunity to review the draft plan, supported interaction with other stakeholders, and assisted with public involvement efforts.

A summary of Planning Partnership activities, including meetings held during the development of the plan, is included in Table 3-3. This summary table identifies only the formal meetings and milestone events held during the plan update process and does not reflect the larger universe of planning activities conducted by individuals and groups throughout the planning process. In addition to these meetings, there was a great deal of communication between Planning Partnership members and the consultant through individual local meetings, phone and email.

After completion of the plan, implementation and ongoing maintenance will become a function of the Planning Partnership as described in Section 7 (Plan Maintenance). The Planning Partnership is responsible for reviewing the draft plan and soliciting public comment as part of an annual review and as part of the five-year mitigation plan updates.





Table 3-4 presents a summary of planning activities and general project planning efforts conducted during the plan development process. It also identifies which DMA 2000 requirements the activities satisfy. Documentation of meetings (agendas, sign-in sheets, minutes, etc.) may be found in Appendix C (Public and Stakeholder Outreach).

	DMA 2000		
Date	Requirement	Description of Activity	Participants
June 24 and June 29, 2022	-	Meetings with NYS DHSES to discuss planning process timeline, NYS and FEMA requirements	Monroe County Office of Emergency Management, NYS DHSES, Tetra Tech
June 5, 2022	2	Project Start Up Meeting: Discuss proposed planning process and scope of work including documenting participation, schedule, and public and stakeholder outreach and involvement.	Monroe County Office of Emergency Management, Tetra Tech
July 2022	2	All municipalities invited to participate in the planning process.	-
July 15, 2022	2, 3c	GIS data collection meeting	Monroe County Office of Emergency Management, Monroe County GIS Operations, Tetra Tech
Bi-Weekly	-	Weekly project status meeting to discuss action items in support of the expedited planning process	Monroe County Office of Emergency Management, Tetra Tech
	1c, 2	Interested jurisdictions submit Letters of Intent to Participate in this planning process, acknowledging municipal participation requirements and identifying planning point(s) of contact.	See Appendix D
August 1, 2022	-	Meeting with Monroe County Communications Department to discuss communication strategy	Monroe County Office of Emergency Management, Monroe County Communications Department, Tetra Tech
August 9, 2022	1b, 2, 3a, 3b, 3c, 4a, 5c	SC Kickoff Meeting: Review project schedule; review municipal participation, discuss municipal Kick Off meeting and local data collection; review and discuss sources and availability of County and regional data; discuss public and stakeholder outreach efforts.	See Appendix D
August 10, 2022	1b, 2, 3a, 3b, 3c, 4a	Municipal Kick-Off Meeting: Complete overview of planning process, plan participant expectations, review of hazards and hazards of concern identification, discussion of data needs and data collection process explaining all provided worksheets, discussion of public and stakeholder outreach efforts	County and municipal representatives and stakeholders. See Appendix D
August 18, 2022	1b	Monroe County Stormwater Coalition Meeting: Presented HMP update process to Coalition and requested input and support. Encouraged municipal representatives to participate in planning process.	Monroe County Stormwater Coalition
August 2022	2	Public project website developed: https://www.monroecountynyhmp.com/	Core Planning Team, Contract Planner
September 2022	2	Online Public Hazard Preparedness and Mitigation survey developed and deployed	Core Planning Team, Contract Planner

Table 3-4. Summary of Mitigation Planning Activities / Efforts





	DMA 2000		
Date	Requirement	Description of Activity	Participants
September 2022	2	Online Stakeholder Hazard Mitigation surveys developed and deployed	Core Planning Team, Contract Planner
September 2022	2	Online Neighboring County Mitigation survey developed and deployed	Core Planning Team, Contract Planner
October 6, 2022	2	Public Information Meetings on planning process held	Core Planning Team, NYS DHSES, Public
October 13, 2022	1a, 3a, 3b, 3c, 3d	Steering Committee Risk Assessment Meeting	See Appendix D
October 13, 2022	1a, 3a, 3b, 3c, 3d	Planning Partnership Risk Assessment Meeting	See Appendix D
October 17, 2022	1a, 2, 4a, 4b, 4c	Mitigation Strategy Workshop	See Appendix D
November 1, 2022	1a, 2, 4a, 4b, 4c	Lakeshore Communities Annex Development Meeting	Town of Brighton, Town of Webster, Town of Parma, City of Rochester, Town of Clarkson, Town of Gates, Village of Hilton, Village of Webster, Town of Greece, Tetra Tech
November 1, 2022	1a, 2, 4a, 4b, 4c	Southeast Communities Annex Development Meeting	Town of Henrietta, Town of Penfield, Town of Rush, Monroe County, Village of Fairport, Village of Honeoye Falls, Town of Perinton, Tetra Tech
November 3, 2022	1a, 2, 4a, 4b, 4c	Southwest Communities Annex Development Meeting	Town of Hamlin, Village of Chile, Town of Wheatland, Town/Village of East Rochester, Village of Churchville, Town of Ogden, Village of Brockport, Village of Scottsville, Town of Riga, Town of Sweden
November 21, 2022	1b, 2, 3, 4, 5	Steering Committee Meeting- Plan Maintenance, Draft Plan Review	Steering Committee; Contract Planner See Appendix D
November 23, 2022	2	Draft Plan posted to public project website	Public and Stakeholders
November 29, 2022	16	FEMA Flood Risk Insurance Open House. Information on the HMP planning process was made available to attendees. Attendees were encouraged to review the Draft Plan.	Public and Stakeholders
December 23, 2022	1b, 2	Public and stakeholder comments to Draft Plan received and incorporated into Final Plan.	Public and Stakeholders
December 23, 2022	All requirements	Final plan submitted to NYS DHSES and FEMA Region II	NYS DHSES, FEMA Region II
Upon plan approval by FEMA	1a	Plan adoption by resolution by the governing bodies of all participating municipalities	All plan participants

Note: TBD = to be determined.

Each number in column 2 identifies specific DMA 2000 requirements, as follows:

1a – Prerequisite – Adoption by the Local Governing Body

1b – Public Participation

- 2 Planning Process Documentation of the Planning Process
- 3a Risk Assessment Identifying Hazards
- 3b Risk Assessment Profiling Hazard Events
- 3c Risk Assessment Assessing Vulnerability: Identifying Assets
- 3d Risk Assessment Assessing Vulnerability: Estimating Potential Losses
- 3e Risk Assessment Assessing Vulnerability: Analyzing Development Trends
- 4a Mitigation Strategy Local Hazard Mitigation Goals
- 4b Mitigation Strategy Identification and Analysis of Mitigation Measures

4c - Mitigation Strategy - Implementation of Mitigation Measures

- 5a Plan Maintenance Procedures Monitoring, Evaluating, and Updating the Plan
- 5b Plan Maintenance Procedures Implementation through Existing Programs
- *5c Plan Maintenance Procedures Continued Public Involvement*





3.3 Stakeholder Outreach and Involvement

This section details the outreach to, and involvement of, the many agencies, departments, organizations, nonprofits, districts, authorities, and other entities that have a stake in managing hazard risk and mitigation, commonly referred to as stakeholders.

Diligent efforts were made to assure broad regional, county, and local representation in this planning process. To that end, a comprehensive list of stakeholders was developed with the support of the Steering and Planning Partnerships. Stakeholder outreach was performed early and throughout the planning process. In addition to "mass media" notification efforts, identified stakeholders were invited to attend the Planning Partnership risk assessment meeting, while key stakeholders were requested to participate on the Steering and/or Planning Partnerships. Information and input provided by these stakeholders has been included throughout this plan where appropriate, as identified in the references.

The following is a list of the various stakeholders that were invited to participate in the development of this plan, along with a summary of how these stakeholders participated and contributed to the plan. This summary listing cannot represent the sum total of stakeholders that were aware of and/or contributed to this plan since formal and informal outreach efforts were utilized throughout the process by the many planning partners involved in the overall effort. Complete documentation of such broad-based and often locally focused efforts is impossible. Instead, this summary is intended to demonstrate the scope and breadth of the stakeholder outreach efforts made during the planning process.

3.3.1 Federal Agencies

FEMA Region II: Provided updated planning guidance; provided summary and detailed NFIP data for planning area; presented preliminary regulatory flood products to municipalities and the public; attended meetings; participated in a Mitigation Strategy Workshop; conducted plan review.

Information regarding hazard identification and the risk assessment for this HMP update was requested and received or incorporated by reference from the following agencies and organizations:

- National Centers for Environmental Information (NCEI)
- National Hurricane Center (NHC)
- National Oceanic and Atmospheric Administration (NOAA)
- National Weather Service (NWS)
- Storm Prediction Center (SPC)
- U.S. Army Corps of Engineers (USACE)
- U.S. Census Bureau

3.3.2 State Agencies

New York State Department of Homeland Security and Emergency Services (NYS DHSES: Headquarters and Region II): Administered planning grant and facilitated FEMA review; provided updated planning guidance; attended meetings; participated in the Mitigation Strategy Workshop, provided review of Draft and Final Plan.

New York State Department of Environmental Conservation (NYSDEC): Provided data and information on the number and locations of dams.





3.3.3 County and Regional Agencies, Commissions and Non-Profits

The following county/regional agencies, commissions, and non-profits were invited to participate during the planning process. The table below describes how each participated.

Table 3-5. County and Regional Agencies, Commissions, and Non-Profits

Participation
Served on steering committee, attended meetings, completed hazard of concern exercise and goals and objectives exercise and reviewed draft plan.
Served on steering committee, provided input, and reviewed draft plan.
Served on steering committee, attended meetings, and provided input and reviewed draft plan.
Served on steering committee, attended meetings and reviewed draft plan.
Served on steering committee, attended meetings, completed hazards of concern exercise and goals and objectives exercise and reviewed draft plan.
Served on steering committee, attended meetings, completed hazards of concern exercise and goals and objectives exercise and reviewed draft plan.
Served on steering committee, attended meetings, completed hazards of concern exercise and goals and objectives exercise and reviewed draft plan.
Served on steering committee, attended meetings, completed hazards of concern exercise and goals and objectives exercise and reviewed draft plan.
Served on the steering committee, provided input, and reviewed draft plan .
Served on the steering committee, provided input, and reviewed draft plan.
Served on steering committee, attended meetings, completed hazards of concern exercise and goals and objectives exercise, and reviewed draft plan.
Served on steering committee, attended meetings, provided input and reviewed draft plan.
Served on steering committee, attended meetings, completed hazards of concern exercise and goals and objectives exercise and reviewed draft plan.
Provided input and reviewed draft plan.
Provided input and reviewed draft plan.
Provided input and reviewed draft plan.
Provided input and reviewed draft plan.
Provided input and reviewed draft plan.
Provided input and reviewed draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan.
Invited to take the stakeholder survey and review the draft plan. Invited to take the stakeholder survey and review the draft plan.





County and Regional Agencies, Commissions and Non-Profits	Participation
Jewish Family Services	Invited to take the stakeholder survey and review the draft plan.
Baden Street Settlement	Invited to take the stakeholder survey and review the draft plan.
Bethany House	Invited to take the stakeholder survey and review the draft plan.
Beyond the Sanctuary	Invited to take the stakeholder survey and review the draft plan.
Big Brothers Big Sisters of GR	Invited to take the stakeholder survey and review the draft plan.
Bishop Sheen Ecumenical Housing Foundation, Inc.	Invited to take the stakeholder survey and review the draft plan.
Bivona Child Advocacy Center	Invited to take the stakeholder survey and review the draft plan.
Booth Haven & Safe Haven	Invited to take the stakeholder survey and review the draft plan.
Boys & Girls Clubs of Rochester	Invited to take the stakeholder survey and review the draft plan.
Catholic Charities (CCCS)	Invited to take the stakeholder survey and review the draft plan.
Catholic Charities (CFC)	Invited to take the stakeholder survey and review the draft plan.
CCFCS	Invited to take the stakeholder survey and review the draft plan.
490 Farmers	Invited to take the stakeholder survey and review the draft plan.
Action for a Better Community, Inc.	Invited to take the stakeholder survey and review the draft plan.
Agape Haven of Abundance	Invited to take the stakeholder survey and review the draft plan.
Asbury Day Care Center	Invited to take the stakeholder survey and review the draft plan.
Center for Community Alternatives	Invited to take the stakeholder survey and review the draft plan.
Center for Employment Opportunities	Invited to take the stakeholder survey and review the draft plan.
Charles Settlement House	Invited to take the stakeholder survey and review the draft plan.
Coffee Connection	Invited to take the stakeholder survey and review the draft plan.
Community Place of Greater Rochester	Invited to take the stakeholder survey and review the draft plan.
Compeer Rochester	Invited to take the stakeholder survey and review the draft plan.
CP Rochester	Invited to take the stakeholder survey and review the draft plan.
Crossroads of Caring, Inc.	Invited to take the stakeholder survey and review the draft plan.
Daystar Kids	Invited to take the stakeholder survey and review the draft plan.
Deaf Refugee Advocacy	Invited to take the stakeholder survey and review the draft plan.
Depaul Hopelink	Invited to take the stakeholder survey and review the draft plan.
Eagle Star Housing	Invited to take the stakeholder survey and review the draft plan.
Empire Justice Center	Invited to take the stakeholder survey and review the draft plan.
Episcopal Diocese of Rochester	Invited to take the stakeholder survey and review the draft plan.
Family Promise of Greater Rochester	Invited to take the stakeholder survey and review the draft plan.
Girl Scouts of Western New York	Invited to take the stakeholder survey and review the draft plan.
Healers Village/ Ubntu Village Works	Invited to take the stakeholder survey and review the draft plan.
Heritage Christian Services	Invited to take the stakeholder survey and review the draft plan.
Hillside	Invited to take the stakeholder survey and review the draft plan.
JustCause	Invited to take the stakeholder survey and review the draft plan.
Landmark Society of Western NY	Invited to take the stakeholder survey and review the draft plan.
Legal Aid Society of Rochester, NY Inc.	Invited to take the stakeholder survey and review the draft plan.
Legal Assistance of Western New York, Inc.	Invited to take the stakeholder survey and review the draft plan.
Lifespan	Invited to take the stakeholder survey and review the draft plan.





County and Regional Agencies, Commissions and Non-Profits	Participation
Living Word COGIC Outreach	Invited to take the stakeholder survey and review the draft plan.
Loop Ministries	Invited to take the stakeholder survey and review the draft plan.
The Center for Youth Services	Invited to take the stakeholder survey and review the draft plan.
TRU-Impact Inc.	Invited to take the stakeholder survey and review the draft plan.
Urban League of Rochester	Invited to take the stakeholder survey and review the draft plan.
Webster Comfort Care House	Invited to take the stakeholder survey and review the draft plan.
Willow DV Center	Invited to take the stakeholder survey and review the draft plan.
Depaul	Invited to take the stakeholder survey and review the draft plan.
Save Rochester Inc.	Invited to take the stakeholder survey and review the draft plan.
Seneca Waterways Council, BSA	Invited to take the stakeholder survey and review the draft plan.
Sisters of St. Joseph	Invited to take the stakeholder survey and review the draft plan.
SportNet, Division of CP Rochester	Invited to take the stakeholder survey and review the draft plan.

U.S. Geological Survey (USGS): Provided data and information.

Academia (School districts and other academic institutions): Many municipalities directly involved school district representatives in the planning process, as identified in Table 3-3. Municipalities were asked to invite representatives of their local schools to complete a stakeholder survey. Additionally, the following school districts, colleges, and academic organizations in the county were invited to complete a stakeholder survey and review the draft plan:

- Bryant and Stratton College in Greece and Henrietta
- Colgate Rochester Crozer Divinity School
- Monroe Community College in Brighton with a campus in the city
- Nazareth College in Pittsford
- Roberts Wesleyan College in Chili
- Rochester Institute of Technology in Henrietta
- St. Bernard's School of Theology and Ministry in Pittsford
- State University of New York at Brockport
- University of Rochester
- Rochester City School District

- Brockport Central School District
- Churchville-Chili Central School District
- Fairport Central School District
- Gates Chili Central School District
- Penfield Central School District
- Pittsford Central School District
- Allendale Columbia School
- Rochester School for the Deaf
- New York Sea Grant
- Mary Cariola Center
- ROCmusic Collaborative
- EnCompass: Resources for Learning
- Hochstein School

Law Enforcement: Many municipalities directly involved police and other law enforcement representatives in the planning process, as identified in Table 3-3. Municipalities were asked to invite their law enforcement agencies to complete a stakeholder survey. Further, the following police departments and law enforcement agencies in the County were invited to complete a stakeholder survey and review the draft plan:

- Fairport Police
- Brighton Police

- Irondequoit Police
- New York State Police



- Monroe County Sheriff
- Brockport Police
- Gates Police
- Rochester Police

- East Rochester Police
- Webster Police
- Ogden Police
- Greece Police

Fire Districts and Fire Departments: Many municipalities directly involved fire district/department, haz-mat teams, and rescue team representatives in the planning process, as identified in Table 3-3. Municipalities were asked to invite their fire departments to complete a stakeholder survey. In addition, the following fire district/department, haz-mat teams, and rescue team representatives in the County were invited to complete a stakeholder survey and review the draft plan:

- NY State Fire
- Town of Hamlin Fire Marshal
- Village of Honeoye Falls Fire Chief
- Town of Parma Fire Marshal
- Town of Penfield Fire Marshal

- Town of Pittsford Fire Marshal
- City of Rochester Deputy Fire Chief
- Town of Webster Fire Marshal
- Town of Wheatland Fire Marshal

Hospitals and Health-Care Facilities: The following hospitals and health-care facilities in the County were invited to complete a stakeholder survey and review the draft plan:

- Monroe Community Hospital (MCH)
- Strong Memorial Hospital (Strong)
- Highland Hospital
- Rochester General Hospital
- Unity Hospital
- Common Ground Health
- Center for Community Health and Prevention
- National Technical Institute for the Deaf
- Healthi Kids Coalition
- African American Health Coalition
- National Center for Deaf Health Research
- City of Rochester Bureau of Youth Services

- Rochester Monroe Anti-Poverty Initiative
- Culver Medical Group
- Mental Health Association of Rochester/Monroe County, Inc.
- Rochester Mental Health Center
- Manhattan Square Family Medicine
- Rochester Rehab
- Golisano Autism Center
- Spiritus Christi Mental Health Center
- Huther Doyle
- MC Collaborative
- AutismUp

Ambulance/Emergency Medical Services: Municipalities were asked to invite their ambulance and emergency medical service providers to complete a stakeholder survey. In addition, the following ambulance and emergency medical service providers in the County were also invited to complete a stakeholder survey and review the draft plan:

- City of Rochester Emergency Communications
- Monroe County Emergency Medical Services





Utilities: In addition to municipal utilities, the following utility companies in the County were invited to complete a stakeholder survey and review the draft plan:

- Monroe County Water Authority
- Rochester Water Bureau

Transportation: The following transportation companies and organizations in the County were invited to complete a stakeholder survey and review the draft plan:

- Genesee & Wyoming Railroad Services Inc.
- Medical Motor Service

3.3.4 Adjacent Jurisdictions

The County has made an effort to keep surrounding jurisdictions appraised of the project and allowed the opportunity to provide input to this planning process via a stakeholder survey and a request to review the draft plan. Specifically, the following adjoining county and state representatives were contacted in September 2022 to inform them about the availability of the project website, draft plan documents and surveys, and invited to provide input to the planning process:

- Orleans County (NY)
 - Division of Emergency Management
 - Planning Department
 - o Orleans County Planning Commission
- Genesee County (NY)
 - o Office of Emergency Management
 - Genesee County Planning Commission
 - Genesee County Planning Department
- Livingston County (NY)
 - o Office of Emergency Management
 - Planning Department
 - o Livingston County Planning Commission
- Ontario County (NY)
 - Office of Emergency Management
 - Planning Department
- Wayne County (NY)
 - Office of Emergency Management
 - Planning Department

Input from neighboring counties which responded to the survey is summarized in the section below.

3.3.5 Stakeholder and Neighboring County Survey Summaries

The following provides a summary of the results and feedback received by stakeholders who completed the survey. Feedback was reviewed by the Steering Committee and integrated where appropriate in the plan.

Stakeholder Survey

The stakeholder survey was designed to help identify general needs for hazard mitigation and resiliency within Monroe County from the perspective of stakeholders, as well as to identify specific projects that may be included





in the mitigation plan. It was distributed to identified stakeholders, including the various county and municipal departments and agencies in the County. As of November 7, 2022, 27 stakeholders completed the survey, with respondents coming from the academic/research sector, business/commerce sector, emergency services sector, and public works. Over 50 percent of respondents identified as being from some other sector. The majority of respondents represented groups that either served the City of Rochester (42.1 percent) or Monroe County as a whole (47.4 percent).

When asked if the organization maintains or manages anything within their designated service area, 63.2 percent said no they do not manage any facilities. For those that did answer, they indicated the following facilities: buildings, stormwater infrastructure, roads, or water/sewer plants. The remaining respondents noted a variety of work including human services, sheltering programs, and spiritual health.

73.7 percent of respondents noted that they work with socially vulnerable populations. Examples of this work included:

- Work with the local and national Deaf communities
- Support for individuals with disabilities
- Support for refugees, the economically disadvantaged, developmentally disabled, and those diagnosed with HIV/AIDS
- Housing and services to the homeless population
- Drug and alcohol addiction services
- Services and support for individuals with autism
- Youth and young adult support including sheltering, crisis nurseries, and transitional living
- Reentry programs for prison release
- Support for those with mental health challenges
- Food distribution

Hazard and Damage Identification

29.4 percent of respondents indicated that buildings, facilities, or structures their organization is involved with have been impacted by a natural hazard. Of these, respondents noted wind damage to buildings and utilities, mild flooding, and snow/ice storms.

In addition to asking about whether or not their facilities were damaged, stakeholders were also asked what areas they believe to be the most vulnerable to natural hazards, and the problems they face. The respondents provided hazards and impacts:

- Flooding causing water damage and blocking roads
- Flash floods causing the sanitary sewer main to be overwhelmed
- Damage to overhead electric lines
- Tree damage and fall, especially impacting transportation and power supply
- Communication interruptions, heightened by a lack of cell coverage
- Sanitary sewer main gets overwhelmed during flash flooding events
- Power outages causing a halt in internet services

41.2 percent of respondents indicated they did not know if their facilities are prepared for withstanding natural disasters and 17.7 percent said their facilities are not adequately prepared for withstanding natural disasters. 35.3 percent did feel their facility was prepared. Less than half of respondents believed the transportation





infrastructure serving their facilities is designed and equipped to withstand closures and damage due to natural hazards and are able to provide long-term support for your community's needs.

Only 11.8 percent feel their utility infrastructure is equipped to withstand natural hazards and provide uninterrupted service during a hazard event.

Community Preparedness

43.8 percent of respondents noted they are aware of the location and number of socially vulnerable populations in their community/operating area. Only 13.3 percent felt that education and outreach programs regarding hazards in Monroe County are effective in informing these vulnerable populations on what they should do to prepare for and reduce personal risk to natural disasters.

The majority of respondents were either unsure (40.0 percent) or did not believe (40.0 percent) the public, particularly vulnerable populations are aware of, understand, or take advantage of emergency warning and notification systems and services.

Just under half (46.7 percent) of respondents felt that local government understands, supports, and possesses adequate resources for hazard risk reduction efforts in their community. Over half (53.3 percent) of respondents believe that private businesses play a direct critical role in their organization's operation and daily function.

76.9 percent of total respondents being part of an Emergency Operations Plan, 40.0 percent being part of a Continuity of Operations/Government Plan, and 40.0 percent being part of an Evacuation Plan. More than half (66.7 percent) of participants also indicated their organization is resilient with respect to a natural disaster.

Project Identification

Respondents identified the following projects or programs that could reduce their organization's vulnerability to damages, including operation of service:

- Free and easily accessible training for hazard events.
- Upgrades for communication infrastructure, particularly internet connectivity.

Neighboring County Survey

The neighboring county survey was sent to the surrounding counties of Monroe due to their proximity to the county and because the effects of hazard events that impact Monroe County would be similar to that of their neighbors. As of Thursday, October 10th, 2022, two counties submitted the survey (Orleans County and Livingston County).

The Neighboring County Survey was broken down into 5 sections: Emergency Operations and Continuity of Operations Planning, Risk and Vulnerability, Evacuation and Sheltering, Information Sharing, and Projects, Grants, Education and Outreach, each detailed below.

Emergency Operations and Continuity of Operations Planning

No respondents answered survey questions regarding if any shared service or mutual aid agreements are in place between their county and Monroe County. However, Orleans County noted that Monroe County is involved in their county's emergency operations planning through mutual aid response. Each respondent noted that Monroe County is not involved in their Continuity of Operations Planning. One responded noted that communication improvements are needed regarding emergency operations and disaster response.





Risk and Vulnerability

Livingston County noted that they share risk and vulnerability assessments regarding the Mount Morris Dam with Monroe County.

Evacuation and Sheltering

None of the respondents indicated if there is collaboration with Monroe County on establishing evacuation routes or alternative evacuation routes. However, Orleans County noted they would consult with Monroe County before making evacuation decisions if the need arose. Livingston County noted that evacuation routes may not be maintained to the same level of protection across county lines.

Orleans County noted they would consult with Monroe County if making sheltering decisions would impact Monroe. No shared spaces for temporary housing were identified.

Information Sharing

Both respondents noted they have access to Monroe County's emergency operations centers at the county and local levels.

Projects, Grants, Education, and Outreach

Orleans County noted that flooding along the lakeshore is a concern they share with Monroe. Livingston County noted concerns with vulnerabilities associated with Mount Morris Dam. Orleans County shares information on potential shared mitigation projects during Emergency Management Association meetings and would set up follow up meetings as necessary.

Respondents did not identify any projects as requiring cross-collaboration between county boundaries. However, Orleans and Livingston County both noted they collaborate on grant applications through the Hazmat Consortium. Livingston County noted that DMNA and the Red Cross conduct hazard mitigation related outreach in both Livingston and Monroe Counties.

3.3.6 Public Outreach

In order to facilitate better coordination and communication between the Planning Partnership and citizens and to involve the public in the planning process, it was determined that draft documents will be made available to the public through a variety of venues including printed and online format. This effort is intended to increase the likelihood of hazard mitigation becoming one of the standard considerations in the evolution and growth of Monroe County.

The Steering and Planning Partnerships have made the following efforts toward public participation in the development and review of the Plan:

- The public was informed of the hazard mitigation planning effort commencement at the kick-off meeting and through press releases, news articles, and public service announcements released throughout the planning process. Copies of these announcements may be found in Appendix C.
- Media Release to local news sources.
- To inform the public and County agencies of the ongoing plan update effort, updates regarding the mitigation planning process have been made at county-wide meetings including those of the Monroe County Stormwater Coalition
- A public website is being maintained as another way to facilitate communication between the Steering Committee, planning partnership, public and stakeholders (<u>www.Monroecountynyhmp.com</u>). The





public website contains a project overview, County and local contact information, access to the citizens survey and various stakeholder surveys, and sections of the HMP for public review and comment.

- All participating municipalities have been encouraged to distribute press releases on the project, including links to the project webpage and citizen and stakeholder surveys. Municipalities posting information and supporting online outreach include:
 - o Town of Chili
 - o Town of Ogden
 - Town of Parma
 - Town of Penfield
 - Town of Perinton
 - Town of Webster
 - Village of Fairport
 - Village of Spencerport
 - Village of Webster
- In order to facilitate coordination and communication between the Planning Partnership and citizens and involve the public in the planning process, the Plan Update will be available to the public through a variety of venues. A printed version of the Plan will be maintained at the Monroe County Office of Emergency Management, and Monroe County Department of Planning.
- An on-line natural hazards preparedness citizen survey was developed to gauge household preparedness that may impact Monroe County and to assess the level of knowledge of tools and techniques to assist in reducing risk and loss of those hazards. The questionnaire asks quantifiable questions about citizen perception of risk, knowledge of mitigation, and support of community programs. The questionnaire also asks several demographic questions to help analyze trends.
- The questionnaire was posted on the County website on September 14, 2022, and was available through November 7th for public input. All participating municipalities have been requested to advertise the availability of the survey via local homepage links, and other available public announcement methods (e.g., Facebook, Twitter, email blasts, etc.). Roughly 100 responses have been collected. A summary of survey results is provided later in this Section with full results provided in Appendix C of this plan.
- Directed response surveys were distributed to Academia, Fire Departments, EMS, Hospitals and Healthcare Organizations, Business and Commercial interests, Utilities and Law Enforcement stakeholders as detailed in the Stakeholder outreach subsection of this chapter. A summary of survey results is provided later in this Section with full results provided in Appendix C of this plan. In addition, an example of the directed stakeholder surveys is presented in Appendix C.
- Public Information meetings on the HMP update process with both virtual and in-person options were held on October 6, 2022. A recording of one meeting was posted on the HMP webpage.
- The Draft Plan was posted to the public website as of November 23, 2022, for public review and comment. All public comments were directed to the Monroe County Office of Emergency Management for collection and review by the Steering Committee. All public comments received were forwarded to the appropriate jurisdiction and/or agency and incorporated into the final plan as appropriate.
- Information on the draft HMP was made available at a FEMA Flood Risk and Insurance Open House that was hosted by Monroe County and took place during the public review period.
- Once submitted to NYS DHSES/FEMA, the Final Plan will be available for public review and comment in the same manner and format as the Draft Plan, as well as in hard-copy format at the following as identified in Section 7, "Plan Maintenance".

Examples of virtual outreach via websites and social media completed by the County and municipalities are provided below.



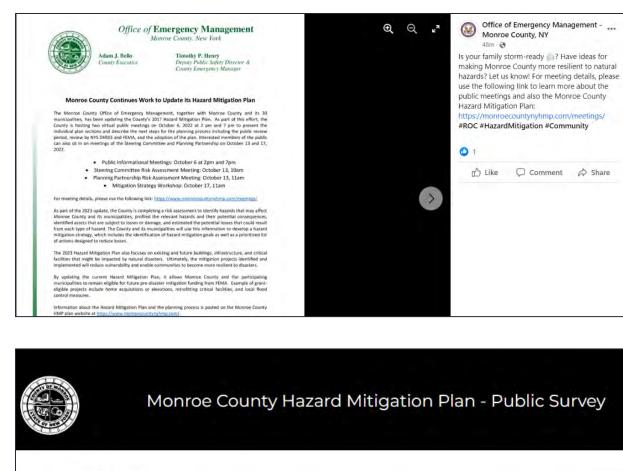


Figure 3-1. Monroe County HMP Webpage and Local On-Line Outreach









1. Introduction

Monroe County Residents,

Monroe County has assembled a team to update our hazard mitigation plan which addresses hazards that may impact our county and municipalities. Please help us plan for future disaster by completing this survey regarding hazards in the county.

This survey is designed to help us gather information from around Monroe County to help us better coordinate activities and reduce the risk of injury or property damage. These questions are for information-gathering only and do not necessarily reflect any intent or future priorities of any governing body. This information will be shared with municipal, state, federal, and county entities for planning purposes only.

You will be asked if you live in a floodplain. If you do not know, or are not sure, please check the FEMA website: https://msc.fema.gov/portal/home.

The Monroe County Hazard Mitigation Planning Partnership thanks you in advance for your cooperation and participation.





own of Chili	
own or crimi	
QUICKLINKS	
me	Monroe County Hazard Mitigation Plan
li Community Center	Home / News / Monroe County Hazard Mitigation Plan
li Bicentennial	
Bicentennial Gala Bicentennial Activities	Is your family storm-ready? Have ideas for making Monroe County more resilient to natural disasters? Let us know! We are updating the
Bicentennial Exhibit Bicentennial 5K & Family Walk	County's Hazard Mitigation Plan and are looking for your feedback to inform our planning process. Take the survey to contribute your knowledge!
Bicentennial Timeline	hiomede.
Area Promotional Videos Chili History Slideshow Part 1	MONROE COUNTY HAZARD
Chill History Slideshow Part 2 Celebration of First Town Board	MITIGATION PLAN UPDATE
Will the Meeting Come to Order Historical Digest of Early Chili	LIVE OR WORK IN THE COUNTY? WE NEED YOUR HELP!
Chili Trivia	
Trivia Answer Key April is Business Month	Granth & Finding Flass & Prepare Millipole
Chili Business Passport	CLICK HERE TO TAKE THE PUBLIC SURVEY-
A Mes Count	y Department Of
A Mes Count Emerc	y Department Of
A Mes Count Emerc	y Department Of gency Preparedness
A Mes Count Emerc	y Department Of gency Preparedness
A Mes Count Emerco Search our website:	y Department Of gency Preparedness
A Mes Count Emerco Search our website:	y Department Of Bency Preparedness
A Mes Count Emerco Search our website:	y Department Of Bency Preparedness
A Mes Count Emerco Search our website:	y Department Of Bency Preparedness
A Mes Count Emerco Search our website:	y Department Of Bency Preparedness
A Mess Count Emercies Search our website: Popular Searches: Popular Searches	A processes State Management
A Mess Count Emercies Search our website: Popular Searches: Popular Searches	A processor Market Server
A Mess Count Emercies Search our website: Popular Searches: Popular Searches	A provide the begin searching Exactly Market States Market States Mar
A Mess Count Emercies Search our website: Popular Searches: Popular Searches	A processor Market Server
A Mes Count Ecount Ecount Ecount Ecount Ecount C	Yore to begin searching Yo
A Mess Count Emercies Search our website: Popular Searches: Popular Searches	A provide the begin searching Exactly Market States Market States Mar







Public Survey Summary

Those that live and work in Monroe County were given the opportunity to be involved in the planning process. One opportunity was the public survey. As stated above, the survey was developed to assess the level of knowledge of tools and techniques to assist in reducing risk and loss of those hazards. It asked quantifiable questions about citizen perception of risk, knowledge of mitigation, and support of community programs. The County advertised the survey on their website and social media accounts. As of November 2022, the survey received 94 responses.

Most residents receive information concerning natural hazards through the internet (77.5%) or social media (67.6%). Demographically, survey respondents were from 22 municipalities within Monroe County, with 51 percent having lived in the County for 20 years or more. The most common (31.9 percent) age of respondents was over the age of 60. The majority (77.5 percent) of residents receive information concerning a natural hazard through the internet. Over half (67.6 percent) receive information through TV news or radio news (57.8 percent).

Survey respondents identified the following as the top 5 most frequently occurring natural hazard events within Monroe County in the past 10 years, as shown in Figure 3-2:

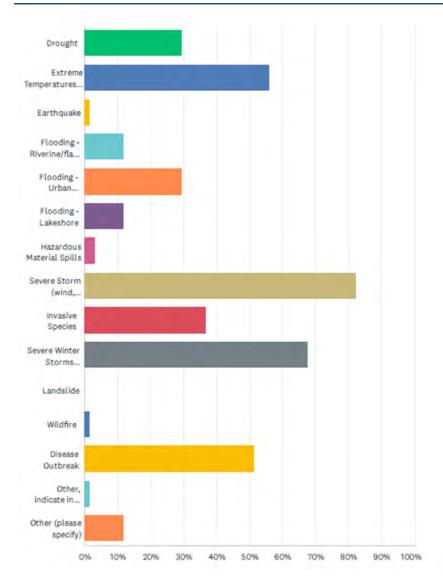




- Severe storms wind, lightning, hail (82.4 percent)
- Severe winter storms blizzard, heavy snow, ice (67.7 percent)
- Extreme temperature heat and cold (55.9 percent
- Disease outbreak (51.5 percent)
- Invasive species (36.8 percent)

The highest hazards of concern (respondents reporting somewhat concerned, very concerned, or extremely concerned) include Extreme Temperatures, Severe Winter Storms, and Disease Outbreak.





Respondents identified the following as desired projects to implement to reduce the damages due to natural hazards:

- Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities etc.) (80.0 percent)
- Improve and strengthen infrastructure, such as elevating roadways and improving drainage systems (70.8 percent)





- Replace inadequate or vulnerable bridges and causeways (46.2 percent)
- Provide better information about hazard risks and high-hazard areas (33.9 percent)
- Assist vulnerable property owners with securing funding to mitigate their properties (30.8 percent)

Respondents were then given the opportunity to propose their own projects they would like to see implemented in Monroe County. Suggestions included assisting lakeshore property owners with flood protection, stormwater infrastructure upgrades, and electrical utility improvements.

Respondents were asked how much money they would be willing to spend on their current home to help protect it from the impacts of potential future natural disasters. 23.0 percent of respondents indicated they would spend between \$5,000 and \$9,999, while 24.6 percent of respondents do not know how much they would be willing to spend. However, 18 respondents provided the amount of money they have already spent on hazard mitigation, ranging from \$500 to over \$56,000, for items such as stormwater systems, window replacements, and shoreline fortification. 43 respondents indicated they would be incentivized by grants, tax breaks, funding assistance, insurance discounts, low interest rate loans, waivers, and/or lower insurance rates to protect their home from natural hazard impacts.

Please list any additional types of projects you believe local, county, state or federal government agencies could be doing in order to reduce the damage and disruption of natural disasters in Monroe County.

"Help Ontario lakeside property owners with flood protection."

"Storm drains repair and increased drainage for roads and parks."

"Convert overhead power lines to underground"

Respondents were also asked about their property's location within the floodplain, and if they have flood insurance. Of the 71 respondents who answered this question, only 5 (78.9 percent) indicated that their property is located in a designated floodplain. However, 7 residents (9.9 percent) indicated their home is covered by flood insurance.

The most self-selected jurisdictions respondents indicated that they live in, include the Town of Perinton, the City of Rochester, the Town/Village of East Rochester, and the Town of Chili.

Municipality-specific responses can be found in Section 9 (Jurisdictional Annexes).

Refer to Appendix D (Public and Stakeholder Outreach) for the full list of survey questions and responses.

3.4 Incorporation of Existing Plans, Studies, Reports and Technical Information

The Monroe County Hazard Mitigation Plan strives to use the best available technical information, plans, studies and reports throughout the planning process to support hazard profiling; risk and vulnerability assessment; review and evaluation of mitigation capabilities; and the identification, development and prioritization of County and local mitigation strategies.

The asset and inventory data used for the risk and vulnerability assessments is presented in the County Profile (Section 4). Details of the source of this data, along with technical information on how the data was used to develop the risk and vulnerability assessment, is presented in the Hazard Profiling and Risk Assessment Section (Section 5), specifically within Section 5.3 (Data and Methodology), as well as throughout the hazard profiles in Section 5.4. Further, the source of technical data and information used may be found within the References section.





Plans, reports and other technical information were identified and accessed online or provided directly by the County, participating jurisdictions and numerous stakeholders involved in the planning effort, as well as through independent research by the planning consultant. The County and participating jurisdictions were tasked with updating the inventory of their Planning and Regulatory capabilities (see Capability Assessment section of each jurisdictional annex in Section 9) and providing relevant planning and regulatory documents as applicable. Relevant documents, including plans, reports, and ordinances were reviewed to identify:

- Existing municipal capabilities;
- Needs and opportunities to develop or enhance capabilities, which may be identified within the County or local mitigation strategies;
- Mitigation-related goals or objectives, considered in the review and update of the overall Goals and Objectives (see Section 6);
- Proposed, in-progress, or potential mitigation projects, actions and initiatives to be incorporated into the updated County and local mitigation strategies.

The following local regulations, codes, ordinances and plans were reviewed during this process in an effort to develop mitigation planning goals and objectives and mitigation strategies that are consistent across local and regional planning and regulatory mechanisms; and thus, develop complementary and mutually supportive strategies, including:

- Comprehensive/Master Plans
- Building Codes
- Zoning and Subdivision Ordinances
- NFIP Flood Damage Prevention Ordinances
- Site Plan Requirements
- Local Waterfront Revitalization Plans
- Stormwater Management Plans
- Emergency Management and Response Plans
- Land Use and Open Space Plans
- Capital Plans
- Climate Smart Community Program
- Community Rating System
- New York State Standard Multi-Hazard Mitigation Plan, 2019

During the course of this planning process, a concerted effort was made to review all relevant plans contributing to the capability of the County and each municipality to integrate effective mitigation efforts into the daily activities of the county and municipalities. Documentation of this extensive review is reflected in the capability assessment table in each of the municipal annexes wherein the plan types, names, and dates are indicated in the table as well as a summary of how the plan supports mitigation and resilience.

3.5 Integration with Existing Planning Mechanisms and Programs

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the County there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those existing plans and programs.

The "Capability Assessment" section of Chapter 6 (Mitigation Strategy) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (Federal, State, County and





local) that support hazard mitigation within the County. Within each jurisdictional annex in Chapter 9, the County and each participating jurisdiction have identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("integration capabilities") and how they intend to promote this integration ("integration actions").

A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7.

3.6 Continued Public Involvement

Monroe County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This Plan update will be posted on-line (currently at https://www.monroecountynyhmp.com/), and municipalities will be encouraged to maintain links to the plan website. Further, the County will make hard copies of the Plan available for review at public locations as identified on the public plan website.

A notice regarding annual updates of the plan and the location of plan copies will be publicized annually after the Planning Partnership's annual evaluation and posted on the public website (currently at https://www.monroecountynyhmp.com/).

Each jurisdiction's governing body shall be responsible for receiving, tracking, and filing public comments regarding this plan.

The public will have an opportunity to comment on the plan as a part of the annual mitigation planning evaluation process and the next five-year mitigation plan update. The HMP Coordinator (currently Mr. Timothy Henry of the Monroe County Office of Emergency Management) is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the 5-year plan update as appropriate; however, members of the Planning Partnership will assist the HMP Coordinator. Additional meetings may also be held as deemed necessary by the Planning Partnership. The purpose of these meetings would be to provide the public an opportunity to express concerns, opinions, and ideas about the plan.

Further details regarding continued public involvement are provided in Section 7.

After completion of this plan, implementation and ongoing maintenance will continue to be a function of the Planning Partnership. The Planning Partnership will review the plan and accept public comment as part of an annual review and as part of five-year mitigation plan updates.

A notice regarding annual updates of the plan and the location of plan copies will be publicized annually after the HMP Committee's annual evaluation and posted on the public web site.

Mr. Timothy Henry of the Monroe County Office of Emergency Management has been identified as the ongoing County All-Hazard Mitigation Plan Coordinator (see Section 7), and is responsible for receiving, tracking, and filing public comments regarding this Plan Update. Contact information is:

Mailing Address:	Monroe County Public Safety Department Office of Emergency Management
	1190 Scottsville Road, Suite 200 Rochester, NY 14624
Contact Name:	Mr. Timothy Henry





Email Address:timhenry@monroecounty.govTelephone:(585) 753-3816





Section 4. County Profile

This profile describes the general information of the County (physical setting, population and demographics, general building stock, and land use and population trends) and critical facilities located within Monroe County. In Section 5, specific profile information is presented and analyzed to develop an understanding of the County, including the economic, structural, and population assets at risk and the concerns that may be present related to hazards analyzed (for example, a high percentage of vulnerable persons in an area).

4.1 General Information

4.1.1 History

Formerly a portion of Genesee and Ontario Counties, Monroe County officially became its own county on February 23, 1821, a namesake of President James Monroe. Following the Revolutionary War, people from New England, Maryland, and Pennsylvania came to settle the Genesee River Valley, bringing their knowledge of agriculture and methods of raising cattle and sheep. The settlers built flour and grist mills on the numerous small streams and along the Genesee River.

Prior to American settlement, the Algonquin, Seneca, and Iroquois tribes inhabited the land that is currently Monroe County. The Seneca, who joined the League of the Iroquois, controlled the major east-west and north-south trade routes in that region and were thus known as the "Keepers of the Western Door." Ownership of the land was taken from both tribes in the Phelps and Gorham Purchase in 1788 and the Treaty of Big Tree in 1797. The former was when the Iroquois sold all rights to their land between Seneca Lake and the Genesee River to Oliver Phelps and Nathaniel Gorham, both of Massachusetts, who later defaulted on the purchase. The latter agreement, the Treaty of Big Tree, was formed between the Seneca Nation and the United States, in which the Seneca signed over rights to all territory west of the Genesee River, excluding 12 small tracts of land, for the price of \$100,000 (SUNY Oswego, Date Unknown).

Early European settlement in the County was divided by the Genesee River, with settlements in the east becoming part of the Town of Northfield and those to the west becoming the Town of Northampton. Rapid population growth in the ensuing years altered both towns. On the eastern side of the river, Northfield became Boyle, which split in 1810 to form Penfield, then Perinton in 1812, both Brighton and Pittsford in 1814, and then Henrietta in 1818. Mendon was formed from Bloomfield in 1812 and Rush was created out of Avon in 1818. Irondequoit was formed in 1839 and Webster in 1840. Similar divisions took place on the west side of the river as Northampton split to form Parma and Riga in 1808, Gates in 1812, Sweden in 1813, Ogden in 1817, Clarkson in 1819, and Greece and Chili in 1822. Wheatland was formed in 1821 by a split from Southampton. Union was formed in 1853, and later became Hamlin in 1861.

Before 1821, the towns on both sides of the river were all part of either Ontario or Genesee counties, requiring all transactions to be recorded in the County seats, far from their homes and businesses. The City of Rochester (at that time, known as the Village of Rochesterville) was already a booming mill town, the focal point of settlements and economies in the surrounding towns and villages. At the time of the County's founding, the Village of Rochesterville became the County seat and a Board of Supervisors was elected by the original 14 towns of the new county.

The year 1823 saw the birth of the City of Rochester and was also the year that the first 800-foot (244 m) Erie Canal aqueduct was constructed over the Genesee River, linking north-south trade along the Hudson River in eastern New York State to the potential of larger east-west trade through the Great Lakes and beyond. The completion of the Erie Canal in 1825 created unprecedented economic opportunity for Monroe County farmers





and mills in the City of Rochester. The importance of wheat farming grew as the Erie Canal facilitated the shipment of products to the Port of New York, allowing goods and commodities to be shipped by water almost anywhere in the world. Monroe County's canal system is 42.8 miles long, and has supported many industries in the County's history, from flour, lumber, and nursery flowers to the modern industries of technology, recreation, and innovation.

Soon after the Erie Canal east to the Hudson River was opened in 1825, the County's economy boomed around the burgeoning industries in the Rochester area, and the population soared accordingly. By 1830, the population of the City of Rochester hit 9,200, and the city gained national recognition as "The Young Lion of the West." The prosperous economy soon led to another nickname for the city, the Flour City, based on the numerous flour mills lining the Genesee River within its borders. Less than a decade after the opening of the Erie Canal, roughly 20 mills were producing 44,000 tons of flour annually; the population of Rochester reached 13,500; and the city area expanded to 4,000 acres (16 km²). By the mid-19th Century, Rochester was the 21st largest city in the United States. Westward expansion had shifted the focus of farming out of New York State and Monroe County's importance as the center for flour milling had deteriorated. However, a nursery and seed industry (started decades earlier by William A. Reynolds in Rochester) began to flourish, and several Rochester seed companies had grown to some of the largest in the world, the largest of which was the Ellwanger & Barry Nursery Co. As a result, the City of Rochester took yet another nickname, and was thereafter known as the Flower City.

Monroe County played an important history in the American abolition movement, and in the Civil War. In 1847, former slave and abolitionist leader Fredrick Douglass began publishing a newspaper "The North Star" out of Rochester. Douglass gave some of his most famous anti-slavery speeches while in Rochester, as did other renowned abolitionists including Susan. B. Anthony and William Lloyd Garrison. Elsewhere in the County in those years leading up to the Civil War, citizens were opening up their homes and places of business to shelter fugitive slaves as part of the Underground Railroad. Along with the City of Rochester, such safe houses were reportedly located in the Towns of Brighton, Pittsford, Mendon, Webster, and Chili (Coles 2005). Rochester had emerged as a center for culture, society, and education, and the University of Rochester was founded in 1850.

Later in the 19th century, another form of railroad made its mark on the County. Five freight and passenger railroads passed through Rochester by the middle of the 1890s, expanding on the County's already convenient systems of canals and roadways connecting Monroe County residents and businesses to cities and markets throughout the eastern United States. Inter-urban electric railroads came to Monroe County in the first decade of the 20th century, which included the Rochester, Lockport and Buffalo Railroad, and the Rochester, Syracuse and Eastern Rapid Railroad.

Modern-day Monroe County has come a long way from its early agricultural and milling start, and now prides itself on high-technology industries, manufacturing, and educational institutions. Both the Eastman Kodak and Bausch & Lomb Corporations have their world headquarters in the County, as do manufacturing facilities such as General Motors, Xerox, and ITT Automotive. Furthermore, the University of Rochester, the Rochester Institute of Technology, the National Institute for the Deaf, and five other institutions of higher learning are located in Monroe County.

Today, the County is comprised of 31 municipalities – one city, 20 towns, and ten villages (one of which, East Rochester, is conterminous with the town). The towns and villages of Monroe County are presented in Table 4-1.





Table 4-1. Monroe County Political Jurisdictions

City	Vill	age					
City of Rochester	Village of Brockport	Village of Pittsford					
	Village of Churchville	Village of Scottsville					
	Village of Fairport	Village of Spencerport					
	Village of Hilton	Village of Webster					
	Village of Honeoye Falls						
Towns							
Town of Brighton	Town of Henrietta	Town of Pittsford					
Town of Chili	Town of Irondequoit	Town of Riga					
Town of Clarkson	Town of Mendon	Town of Rush					
Town/Village of East Rochester	Town of Ogden	Town of Sweden					
Town of Gates	Town of Parma	Town of Webster					
Town of Greece	Town of Penfield	Town of Wheatland					
Town of Hamlin	Town of Perinton						

4.1.2 Physical Setting

This section presents the physical setting of Monroe County, including its location, topography, hydrography and hydrology, climate, and land use and land cover.

Location

Monroe County lies in the north-central portion of western New York, northeast of Buffalo and northwest of Syracuse, sharing its northern border with the United States border marked by Lake Ontario. Orleans and Genesee Counties form its western boundary, Livingston County marks the southern border with Ontario County to the southeast, and Wayne County shares a border to the east. Figure 4-1 displays Monroe County and its municipalities.

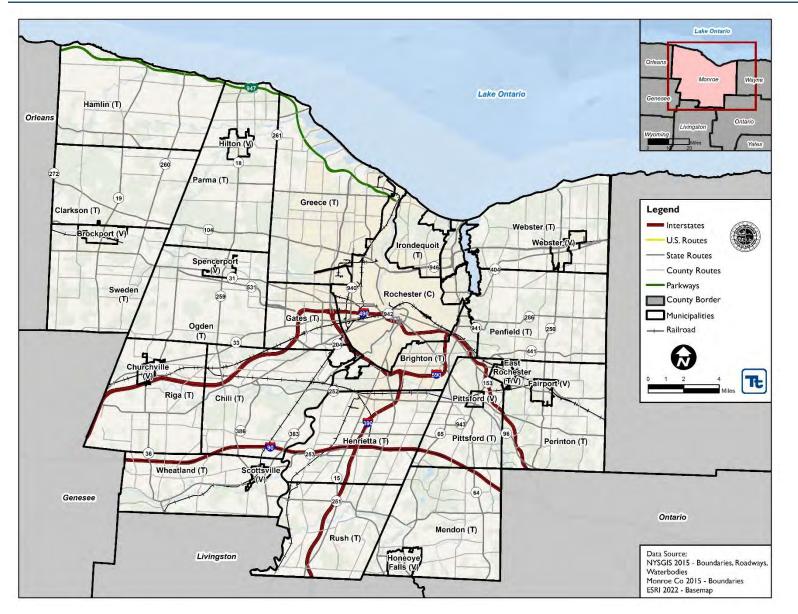
Lake Ontario, one of the Great Lakes, is a predominant feature in Monroe County, as it forms the northern border of the City of Rochester and the Towns of Hamlin, Parma, Greece, Irondequoit, and Webster; and is an important aesthetic, economic, environmental, and cultural resource for the County. The Genesee River is also significant, as it bisects the County into eastern and western sections, running directly through the heart of the City of Rochester and draining to Lake Ontario in the Town of Irondequoit. Topography ranges from gentle rolling hills in the northern parts of the County to steeper slopes and moderately rolling hills in the southern sections.

Monroe County itself is 1,367 square miles with 4,648 miles of road that wind across the County. Interstates (I)-90, I-390, I-490, and I-590 are the primary routes of travel through Monroe County. I-90, built in Monroe County as part of the New York State Thruway in the 1950s, traverses the County from the east to the west through the southern section, passing through the Towns of Wheatland, Chili, Henrietta, Pittsford, and Mendon. In the Town of Henrietta, I-90 intersects with I-390, major north-south route carrying traffic up from Livingston County and other points south and bisecting Monroe County, skirting the City of Rochester to the west and ending near the shores of Lake Ontario where the road continues as the Lake Ontario State Parkway. I-490 is the third major route option for travelers in Monroe County, an auxiliary highway offering a direct route into the City of Rochester from where it splits from I-90 on both the southeastern and southwestern corners of the County. I-490 was constructed in the 1950s along the original path of the Erie Canal through the City of Rochester. Its route serves the Villages of Churchville and Pittsford, among others. It connects with I-390 and New York State Route 390 (NY 390) just west of the City of Rochester and I-590 and NY 590 to the east of the City. Together, these roads comprise the southernmost portion of the Inner Loop Beltway, which circles around the interior of Rochester. State Route 531 connects I-490 to western suburbs including the Towns of Ogden and Gates, and the Villages of Brockport and Spencerport.













Additionally, State Routes 104, 33, 31, and 36 connect the County to its eastern western, and southern neighbors. SR 104 and SR 31 run east west through the northern and central section of the County, respectively. SR 36 begins at the terminus of SR 531 in the Town of Ogden and runs south through the Town of Riga and Wheatland before connecting with Livingston County. SR 33 connects SR 31 in the City of Rochester directly to the City of Buffalo to the west. Often paralleling I-490 along its segments in Monroe County, SR 33 is mostly a rural highway serving local traffic.

Hydrography and Hydrology

Major waterways in Monroe County include the Genesee River, Black Creek, Honeoye Creek, Irondequoit Creek, Oatka Creek, and Shipbuilders Cree. In addition to many creeks and ponds, Lake Ontario provides the northern border of the County. Irondequoit Bay is fed by Irondequoit Creek, between the towns of Irondequoit and Webster.

Watersheds

A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. For example, the watershed of a lake would include not only the streams entering the lake but also the land area that drains into those streams and eventually the lake. Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams. Figure 4-2 depicts the hydrologic system of a watershed (NYCDEP 2015).

Watersheds come in all shapes and sizes and can cross municipal and county boundaries. New York State's waters (lakes, rivers, and streams) fall within one of 17 major watersheds (or drainage basins).

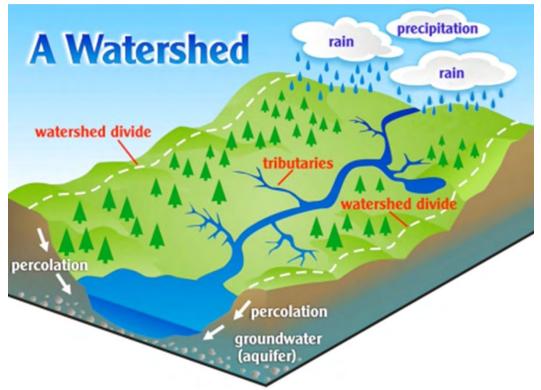


Figure 4-2. Watershed

Source: Riverside-Corona Resource Conservation District 2022





Monroe County creates the landward boundary of the Rochester Embayment of Lake Ontario, a 35-square-mile portion of Lake Ontario between Nine Mile Point in the Town of Webster and Bogus Point in the Town of Parma. At the mouth of the Genesee River, this bay drains approximately 3,000 square miles of upland, including all or parts of ten counties (nine in New York and one in Pennsylvania) including Monroe County. Monroe County drainage into the Rochester Embayment comes from three major sub-basins: The Genesee River Sub-Basin, the Lake Ontario Central Sub-Basin, and the Lake Ontario West Sub-Basin.

Figure 4-4 and Figure 4-3 show the location of watershed and sub watersheds in Monroe County.



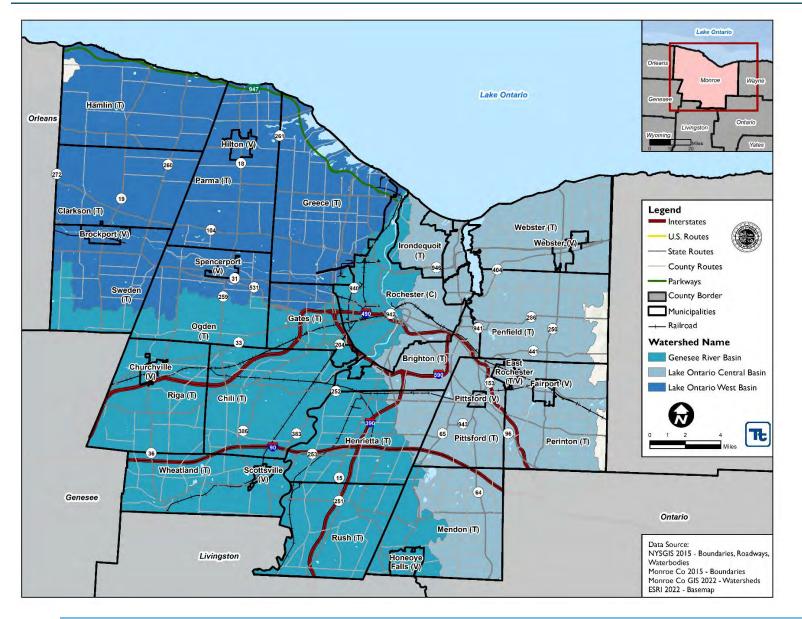


Source: Monroe County GIS 2015





Figure 4-4. Watersheds in Monroe County







Topography and Geology

Consistent with the rest of western New York, the geography and topography of the land that encompasses Monroe County owes its formation to the thawing of glaciers during the last Ice Age. The region is marked by rolling and rounded hills, often elongated with steeper slopes towards the north and more gradual, gentle slopes towards the south. Elevation ranges from 928 feet above sea level at Baker Hill on the Ontario County line in Perinton Township to 246 feet above sea level along the shores of Lake Ontario and Irondequoit Bay, and the lower course of the Genesee River Soil Survey of Monroe (Crabb 1910).

Most of the geology in the County is the result of glacial debris and sediment left behind after the Ice Age. Bedrock in the area is layered by shale, dolomite, and sandstone, and is overlain by soils of sandy loam, silt loam, and gravelly loam. There is a sharp boundary between soils and bedrock in Monroe County, which is evidence of the glacial activity that characterized the region, as soils were transported to their present location rather than created by gradual weathering of rock over time. Soils in Monroe County originated from glacial rivers, flowing terraces, and alluvial fans. Many boulders found in the region are foreign to the area, transported to Monroe County by the massive glaciers that covered the region. As glaciers receded, streams formed from the melting water and cut through the loose soils creating terraces that can be seen in the valleys of streams around the City of Rochester (Wishart n.d.). As a result of more than a century of agricultural and foresting activity, very little of the original, native vegetation remains in the region.

Climate

The climate of Monroe County is fairly humid, and strongly influenced by its proximity to Lake Ontario and the other Great Lakes. Precipitation is regularly distributed across all seasons in terms of quantity, although the frequency of storms is much greater in the winter months when heavy snowfall events occur at highly irregular intervals over varied distances.

Average yearly temperature is about 48.4° Fahrenheit (F). Lake temperatures stabilize the climate through the spring months, resulting in a relatively dry period, although soils remain wet from winter precipitation. Monroe County's summers are typically warm and sunny, with average temperatures between 70 and 72° F and some rain every third or fourth day. Temperatures at any one place in the County normally exceed 90°F roughly nine times each summer. It is uncommon for air temperatures to reach triple digits; however, higher temperatures combined with humidity may lead to days that feel much hotter (National Weather Service, Buffalo Office 2015).

The stabilizing effect of lake waters again leads to mild and dry autumns, but cold weather moves in by late October bringing clouds and early frosts. Monroe County winters are generally cold, cloudy, and snowy. Cold temperatures prevail whenever arctic air masses, under high barometric pressure, flow southward from central Canada or from Hudson Bay (Cornell University College of Agriculture and Life Sciences 2011), and about half of the region's snowfall comes from the "lake effect" process, which creates localized, variable conditions. Lake effect snowfall impacts the eastern portion of the County the most, due to wind patterns coming off Lake Ontario. Total season snowfall ranges from 70 inches in the southern portions of the County to about 90 inches in the City of Rochester, and over 120 inches along the shores of Lake Ontario in the northeastern part of the County. Monroe County's average annual low temperature is 39.5°F (U.S. Climate Data 2015). On average, temperatures fall below 0°F six nights each winter, and temperatures below -10°F are uncommon (National Weather Service, Buffalo Office 2015).

Land Use and Land Cover

The original primeval forest in Monroe County was a mix of several different forest communities. In general, oak dominated on dry slopes while beech was most prevalent in wetter flatland sites. Other common species included shagbark hickory, tulip tree, red maple, and black cherry. Current vegetation consists of agriculture,





deciduous hardwood forests such as sugar maple, beech, yellow birch, ash, red maple, and white oak (Ramsey Lab 2015).

According to the 2020 Monroe Land Use Report published by the Monroe County Department of Planning and Development (MCDPD) Planning Division, the greatest share of land use in Monroe County is residential, with 40.15 percent of all land cover categorized as one of many residential land use categories (in terms of acreage). The next largest shares are agricultural with 21.35 percent, followed by vacant land and commercial, with 15.95 percent and 5.26 percent, respectively. Table 4.2 summarizes the land use categories by the total number of parcels, or properties, in each category. Ranked by number of properties, the top three land uses are Residential with 86.35 percent, Vacant Land with 6.26 percent, and Commercial with 4.67 percent (Monroe County Department of Planning of Development 2022).

Property Code	Category Description	Property Count	Count %	Property Acreage	Acreage %
100	Agricultural	1,565	0.59%	83,337.36	21.35%
200	Residential	229,825	86.35%	156,667.47	40.15%
300	Vacant land	16,665	6.26%	62,253.25	15.95%
400	Commercial	12,442	4.67%	20,514.24	5.26%
500	Recreation and entertainment	670	0.25%	11,197.22	2.87%
600	Community services	2,016	0.76%	20,191.98	5.17%
700	Industrial	866	0.33%	7,064.13	1.81%
800	Public services	893	0.34%	8,055.80	2.06%
900	Wild, forested, conservation lands and public parks	360	0.14%	17,695.86	4.53%
No Data	-	845	0.32%	3,267.67	0.84%
Total	-	266,147	100%	390,254.98	100%

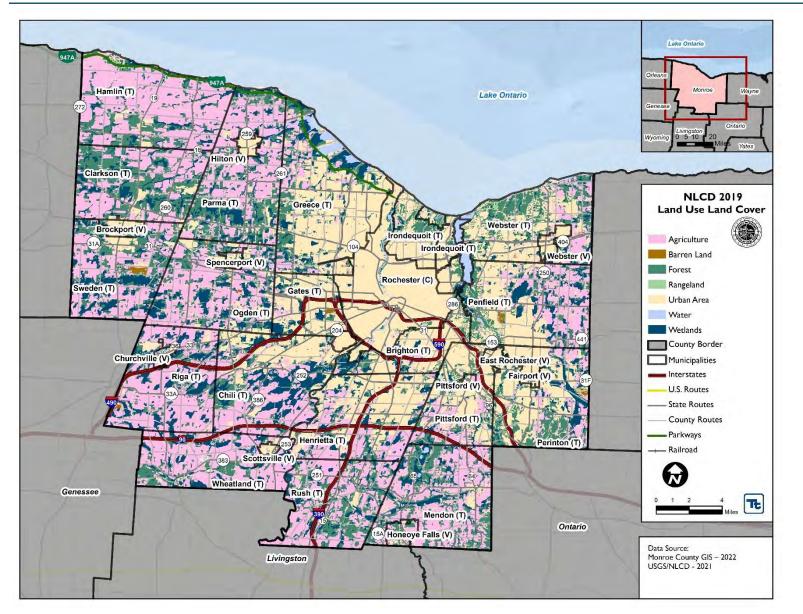
Table 4-2. Monroe County 2020 Land Use Classification Table

Source: Monroe County Department of Planning of Development 2020













New Development

For new development, the County uses best available data to avoid potential hazard exposure where possible. Additionally, the County intends to (1) discourage development within vulnerable areas, areas with high population density, and the Special Flood Hazard Area (SFHA); and (2) encourage higher regulatory standards at the local level.

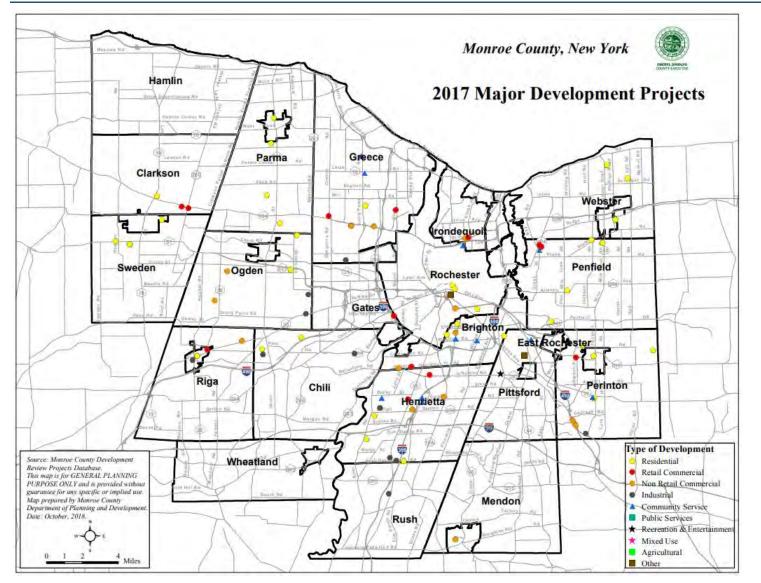
In 2020, Monroe County municipalities issued 711 new residential permits compared to 591 in 2019. There were 97 major projects proposed throughout the County in 2020, 2 of which were applications for rezoning (often indicating future development activity). Residential development made up 35 projects, proposing a total of 1,538 residential units. Four of these submitted residential developments were senior housing projects, proposing a total of 224 senior housing units. The Town of Henrietta was the host of the most projects, with 12, followed by the Towns of Greece and Irondequoit with 10 each, City of Rochester with 7, and Gates with 6.

Figure 4 6 through Figure 4 9 show the major development projects in 2017, 2018, 2019, and 2020 (Monroe County Department of Planning of Development 2022). Individual development projects are detailed in Section 9 under each appropriate jurisdictional annex.







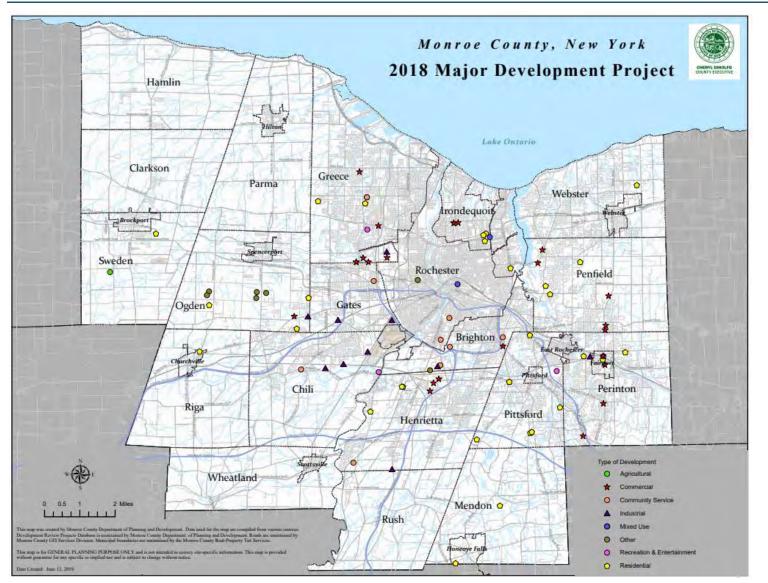


Source: Monroe County Department of Planning of Development 2022

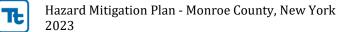






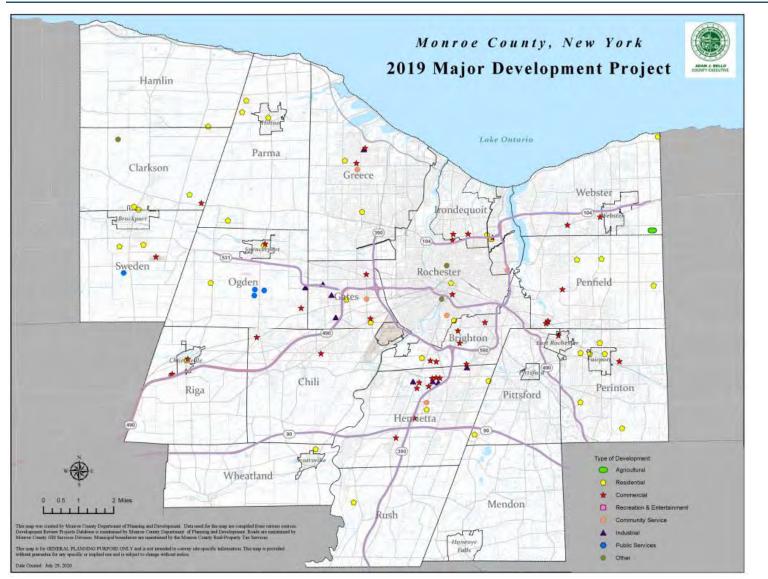


Source: Monroe County Department of Planning of Development 2022







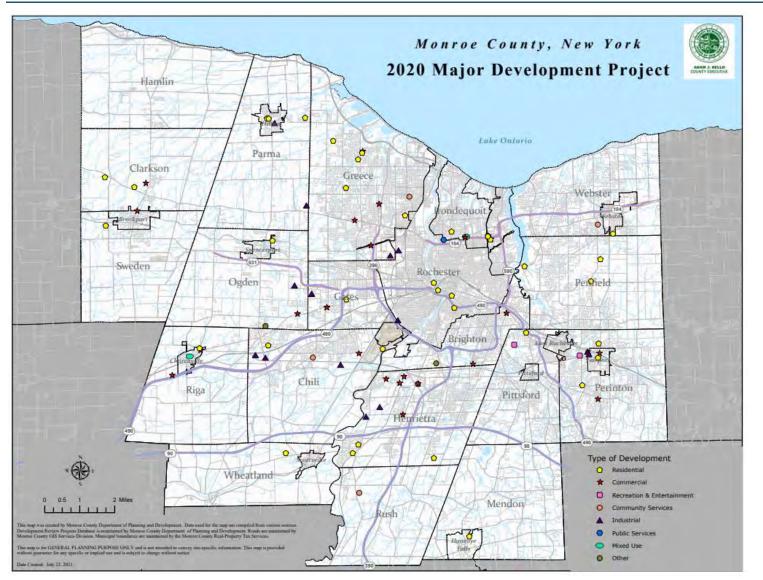


Source: Monroe County Department of Planning of Development 2022









Source: Monroe County Department of Planning of Development 2022





4.2 Population and Demographics

According to the 2020 U.S. Census, Monroe County has a population of 753,109 people. Approximately 28.1 percent of that population resides in the City of Rochester. While the overall population of Monroe County has increased by approximately 1.02 percent since 2010, this growth is not geographically uniform throughout the County, with some areas having experienced a decline in population. However, the 2020 U.S. Census data for Hazards-U.S. Multi-Hazard (HAZUS-MH) are believed to be sufficient and appropriate to support the risk assessment and mitigation planning efforts of this project.

The Federal Emergency Management Agency's (FEMA) Disaster Mitigation Act of 2000 (DMA 2000) requires that hazard mitigation plans (HMP) consider socially vulnerable populations. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. This HMP considers several socially vulnerable population groups: the elderly (persons over the age of 65), the young (persons under the age of 5), non-English speaking households, those with disabilities, and those living below the poverty level (as defined by the U.S. Census Bureau). Table 4-3 and Table 4-4 present the population statistics for each municipality in the County based on the 2010 and 2020 Census data.

			U.S. Census 2010		
Municipality	Total	Pop. 65+	% Pop. 65+	Below Poverty Level	% Below Poverty Level
Brighton (T)	36,609	6,421	18%	2,162	6%
Brockport (V)	8,366	686	8%	661	8%
Chili (T)	28,625	4,229	15%	960	3%
Churchville (V)	1,961	287	15%	96	5%
Clarkson (T)	6,588	851	13%	382	6%
East Rochester (T/V)	6,587	800	12%	544	8%
Fairport (V)	5,353	811	15%	344	6%
Gates (T)	28,400	5,327	19%	1,790	6%
Greece (T)	96,095	16,011	17%	5,208	5%
Hamlin (T)	9,045	929	10%	459	5%
Henrietta (T)	42,581	4,964	12%	2,509	6%
Hilton (V)	5,886	789	13%	164	3%
Honeoye Falls (V)	2,674	406	15%	191	7%
Irondequoit (T)	51,692	9,802	19%	3,706	7%
Mendon (T)	6,478	754	12%	18	0%
Ogden (T)	16,255	1,971	12%	331	2%
Parma (T)	9,747	1,360	14%	314	3%
Penfield (T)	36,242	6,342	18%	1,094	3%
Perinton (T)	41,109	6,940	17%	1,415	3%
Pittsford (T)	28,050	4,909	18%	616	2%
Pittsford (V)	1,355	231	17%	31	2%
Riga (T)	3,629	434	12%	176	5%
Rochester City	210,565	18,955	9%	29,978	14%
Rush (T)	3,478	588	17%	110	3%
Scottsville (V)	2,001	287	14%	68	3%
Spencerport (V)	3,601	497	14%	215	6%
Sweden (T)	5,957	765	13%	376	6%
Webster (T)	37,242	6,028	16%	1,424	4%
Webster (V)	5,399	842	16%	342	6%
Wheatland (T)	2,774	378	14%	154	6%
Monroe County	744,344	103,594	14%	55838	8%

Table 4-3. Monroe County Population and Demographic Statistics, 2010 Census

Source: HAZUS-MH 2.2; U.S. Census Bureau, Census 2010; U.S. Census Bureau, Census 2020





Table 4-4. Monroe County Population and Demographic Statistics 2020 Census, American Community Survey 5-Year Estimates

	U.S. Census 2020*											
Municipality	Total	Over 65	Percent of Jurisdiction Total	Under 5	Percent of Jurisdiction Total	Non-English- Speaking Households	Percent of Jurisdiction Total	Disability	Percent of Jurisdiction Total	Poverty Level	Percent of Jurisdiction Total	
Brighton (T)	37,137	7,492	20.2%	1,294	3.5%	498	1.3%	3,740	10.1%	3,605	9.7%	
5 ()	· · · ·	· · ·	-	, ·		498	-	,	-	,		
Brockport (V)	7,104	1,091	15.4%	120	1.7%	,	0.1%	0	0.0%	1,029	14.5%	
Chili (T)	29,123	5,566 423	19.1% 20.2%	1,580 127	5.4%	214 0	0.7%	3,441	11.8%	1,710	5.9% 4.8%	
Churchville (V)	2,091	-			6.1%	-		316	15.1%	101		
Clarkson (T)	6,904	1,314	19.0%	379	5.5%	34	0.5%	955	13.8%	783	11.3%	
East Rochester (T/V)	6,334	1,135	17.9%	380	6.0%	19	0.3%	960	15.2%	581	9.2%	
Fairport (V)	5,501	1,104	20.1%	113	2.1%	15	0.3%	871	15.8%	759	13.8%	
Gates (T)	29,167	5,954	20.4%	1,611	5.5%	402	1.4%	4,318	14.8%	2,125	7.3%	
Greece (T)	96,926	18,651	19.2%	4,677	4.8%	1,159	1.2%	14,305	14.8%	8,908	9.2%	
Hamlin (T)	8,725	1,537	17.6%	710	8.1%	25	0.3%	1,296	14.9%	670	7.7%	
Henrietta (T)	47,096	6,295	13.4%	2,197	4.7%	516	1.1%	5,239	11.1%	5,222	11.1%	
Hilton (V)	6,027	782	13.0%	483	8.0%	0	0.0%	675	11.2%	661	11.0%	
Honeoye Falls (V)	2,706	549	20.3%	93	3.4%	0	0.0%	281	10.4%	239	8.8%	
Irondequoit (T)	51,043	11,605	22.7%	2,231	4.4%	530	1.0%	7,105	13.9%	3,966	7.8%	
Mendon (T)	6,389	958	15.0%	536	8.4%	0	0.0%	345	5.4%	181	2.8%	
Ogden (T)	16,585	2,664	16.1%	725	4.4%	50	0.3%	1,946	11.7%	1,185	7.1%	
Parma (T)	10,190	1,811	17.8%	379	3.7%	20	0.2%	905	8.9%	562	5.5%	
Penfield (T)	39,438	7,583	19.2%	2,187	5.5%	231	0.6%	3,588	9.1%	1,598	4.1%	
Perinton (T)	39,128	8,731	22.3%	2,364	6.0%	222	0.6%	3,743	9.6%	1,661	4.2%	
Pittsford (T)	25,714	4,857	18.9%	1,267	4.9%	101	0.4%	1,761	6.8%	473	1.8%	
Pittsford (V)	1,419	246	17.3%	92	6.5%	0	0.0%	40	2.8%	23	1.6%	
Riga (T)	3,495	506	14.5%	286	8.2%	0	0.0%	315	9.0%	253	7.2%	
Rochester City	211,328	23,947	11.3%	13,203	6.2%	5,737	2.7%	37,911	17.9%	60,015	28.4%	
Rush (T)	3,490	894	25.6%	113	3.2%	0	0.0%	374	10.7%	151	4.3%	
Scottsville (V)	2,009	368	18.3%	178	8.9%	7	0.3%	250	12.4%	320	15.9%	
Spencerport (V)	3,685	643	17.4%	201	5.5%	0	0.0%	322	8.7%	193	5.2%	
Sweden (T)	6,140	1,059	17.2%	478	7.8%	58	0.9%	1,672	27.2%	942	15.3%	
Webster (T)	39,676	8,368	21.1%	2,112	5.3%	292	0.7%	4,599	11.6%	1,521	3.8%	
Webster (V)	5,651	1.059	18.7%	109	1.9%	211	3.7%	859	15.2%	701	12.4%	
Wheatland (T)	2,888	396	13.7%	226	7.8%	0	0.0%	367	12.7%	346	12.0%	
Monroe County	753,109	127,588	16.9%	40,451	5.4%	10,348	1.4%	102,499	13.6%	100,484	13.3%	

Source: HAZUS-MH 2.2; U.S. Census Bureau, Census 2020

Notes: * 2020 data includes estimates of population percentages based on the 2020 American Community Survey 5-year Estimates





4.2.1 Socially Vulnerable Populations

The Federal Emergency Management Agency's (FEMA) Disaster Mitigation Act of 2000 (DMA 2000) requires that hazard mitigation plans (HMP) consider socially vulnerable populations. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. This HMP considers several socially vulnerable population groups: the elderly (persons over the age of 65), the young (persons under the age of 5), non-English speaking households, those with disabilities, and those living below the poverty level (as defined by the U.S. Census Bureau). Refer to Table 4-3 and Table 4-4 for population statistics for these socially vulnerable populations, for each municipality in the County based on the 2010 and 2020 Census data.

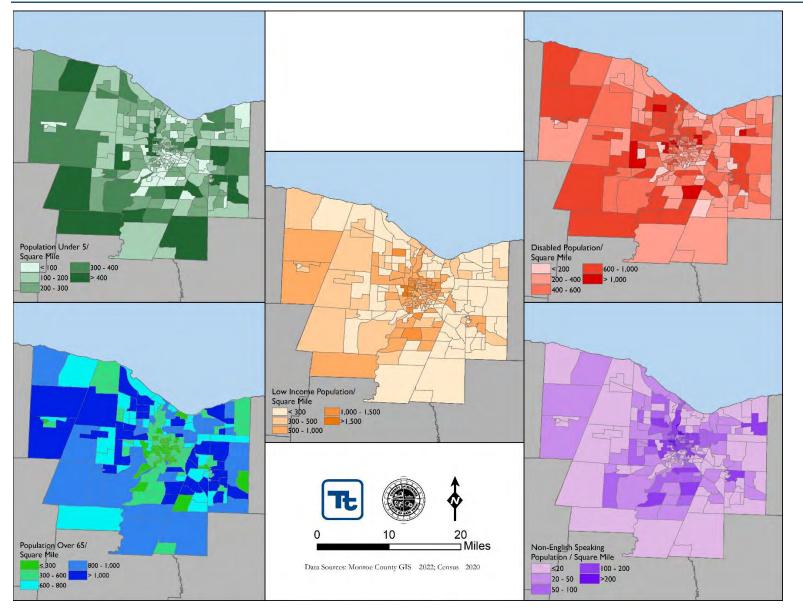
16.9 percent of the Monroe County population is over the age of 65. 5.4 percent of the population in the County is under the age of 5. The 2020 U.S. Census data indicate a total of 13.9 percent of all persons living in households fall below the poverty level (Census 2020).

Figure 4-10 shows the distribution of the general population density (persons per square mile) for persons under 5 years of age, persons over 65 years of age, low-income population, the disabled population, and the non-English speaking population.













1.4 percent of the County's residents live in non-English speaking households (Census 2020). Monroe County averages 8.5 percent of its population characterized as "foreign born." The City of Rochester is a sanctuary city and welcomes refuges from Somalia, Cuba, Bhutan, Iraq, Congo, and Burma primarily (Monroe County Department of Health 2019).

The City of Rochester has a large population of Deaf sign language users and many older adults with hearing loss. Rochester Institute of Technology (RIT) estimates that in the Rochester area there are 42,674 people who are deaf or have serious difficulty hearing, including 19,438 persons younger than 65 years old (National Technical Institute for the Deaf 2012). The Rochester School for the Deaf works with deaf and hard-of-hearing children and their families. The National Technical Institute for the Deaf 2012). The Rochester School for the Deaf D is the largest technical college for deaf and hard-of-hearing students in the country, with approximately 1,400 students. The critical mass of Deaf people influences the local Rochester economy, and many local companies hire qualified Deaf people for blue-collar and white-collar jobs, and local service industries, such as restaurants, are comfortable with Deaf customers. University of Rochester research and clinical training programs include Deaf graduate students, medical students, and fellows. Deaf people migrate to Rochester, attracted by the economic, social, and educational opportunities (Monroe County Department of Health 2019).

4.3 General Building Stock

According to 2020 Census data, 305,210 households are located in Monroe County. A household includes all the people who occupy a housing unit as their usual residence. The Census data identified 338,052 housing units in the county. A housing unit is a house, apartment, mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters (or if vacant, intended for occupancy as separate living quarters). According to the 2020 Census, there are 19,301 vacant housing units in the County (U.S. Census 2020).

For this update, the default general building stock in HAZUS-MH was updated and replaced with a custom building inventory for Monroe County both at the aggregate and structure level. The building stock update was performed using the most current parcel and the New York State Department of Taxation and Finance tax assessment data provided by Monroe County. The tax assessment data was joined to the spatial layer of structure footprints also provided by the County. The replacement cost value was calculated using the square footage value of each building and RS Means 2022 data.

For the purposes of this plan, approximately 312,018 structures were identified by the tax data and spatial data available. These structures account for a replacement cost value of approximately \$173 billion. Estimated content value was calculated by using 50 percent of the residential replacement cost value, and 100 percent of the non-residential replacement values. Using this methodology, approximately \$141 billion in contents exist within these properties. Approximately 79.1 percent of the total buildings in the County are residential, which make up approximately 58.0 percent of the total building stock value. Table 4-5 presents building stock statistics by occupancy class for Monroe County.





Table 4-5. Building Stock Count and Replacement Cost Value (RCV) by Occupancy Class

		All	Occupancies		Residential	Commercial		
		Replacement Cost	Replacement	Total Replacement Cost Value		Total Replacement Cost Value		Total Replacement Cost Value
		Value (Structure	Cost Value	(Structure +		(Structure +		(Structure +
Jurisdiction	Count	Only)	(Contents Only)	Contents)	Count	Contents)	Count	Contents)
Brighton (T)	11,693	\$8,018,612,066	\$6,425,273,936	\$14,443,886,002	10,270	\$5,580,375,863	1,259	\$6,093,196,671
Brockport (V)	2,224	\$2,528,139,646	\$2,630,649,947	\$5,158,789,593	1,610	\$640,479,602	491	\$2,747,646,434
Chili (T)	11,534	\$5,143,090,968	\$4,063,752,918	\$9,206,843,886	10,013	\$3,993,957,118	1,182	\$3,348,362,080
Churchville (V)	1,112	\$524,841,659	\$413,322,418	\$938,164,078	853	\$284,144,029	236	\$503,302,995
Clarkson (T)	3,411	\$1,092,033,825	\$795,358,205	\$1,887,392,030	2,262	\$902,262,571	1,063	\$855,123,448
East Rochester (T/V)	2,924	\$1,867,574,316	\$1,572,596,811	\$3,440,171,127	2,428	\$708,559,999	441	\$2,030,617,679
Fairport (V)	2,394	\$1,241,155,279	\$1,040,300,797	\$2,281,456,076	2,018	\$758,398,775	341	\$1,010,519,831
Gates (T)	11,801	\$6,360,259,250	\$5,860,340,035	\$12,220,599,285	10,541	\$3,786,446,019	1,019	\$3,814,022,542
Greece (T)	36,414	\$15,353,982,024	\$11,600,396,660	\$26,954,378,684	33,432	\$13,272,805,288	2,643	\$8,303,870,789
Hamlin (T)	5,539	\$1,326,520,319	\$992,257,708	\$2,318,778,027	3,699	\$1,076,615,019	1,728	\$946,838,486
Henrietta (T)	15,982	\$12,207,689,238	\$11,252,877,084	\$23,460,566,322	13,249	\$6,095,727,279	2,288	\$9,335,995,519
Hilton (V)	2,143	\$1,217,915,013	\$902,372,975	\$2,120,287,988	1,912	\$708,654,462	189	\$814,073,823
Honeoye Falls (V)	1,155	\$958,640,006	\$854,540,685	\$1,813,180,690	873	\$407,093,838	247	\$844,128,446
Irondequoit (T)	21,885	\$7,952,286,403	\$5,474,720,437	\$13,427,006,840	19,659	\$7,041,068,033	2,108	\$5,061,073,578
Mendon (T)	3,835	\$1,621,833,177	\$1,230,322,737	\$2,852,155,914	2,327	\$1,186,886,439	1,350	\$1,458,365,989
Ogden (T)	7,407	\$3,085,558,975	\$2,472,528,465	\$5,558,087,440	5,604	\$2,296,291,456	1,546	\$1,723,419,525
Parma (T)	5,509	\$1,928,899,846	\$1,444,512,728	\$3,373,412,574	4,007	\$1,529,775,633	1,397	\$1,541,642,328
Penfield (T)	15,882	\$6,562,442,642	\$4,556,791,349	\$11,119,233,991	14,128	\$6,241,168,186	1,461	\$3,108,343,726
Perinton (T)	16,817	\$7,627,088,739	\$5,498,326,668	\$13,125,415,407	14,983	\$6,715,410,339	1,569	\$4,730,871,596
Pittsford (T)	10,590	\$6,033,826,086	\$4,652,947,915	\$10,686,774,001	9,400	\$4,923,430,830	919	\$3,049,673,012
Pittsford (V)	804	\$930,437,470	\$846,397,041	\$1,776,834,511	565	\$258,437,114	218	\$1,307,795,943
Riga (T)	2,356	\$848,605,349	\$690,887,496	\$1,539,492,845	1,365	\$472,009,443	888	\$650,102,259
Rochester (C)	89,392	\$64,962,663,964	\$54,980,707,092	\$119,943,371,056	59,563	\$21,959,576,383	28,315	\$75,946,717,760
Rush (T)	2,808	\$995,725,102	\$820,720,252	\$1,816,445,354	1,405	\$560,863,090	1,204	\$818,170,658
Scottsville (V)	1,069	\$490,385,148	\$418,331,605	\$908,716,753	726	\$248,077,070	308	\$394,234,885
Spencerport (V)	1,654	\$890,802,851	\$690,041,845	\$1,580,844,696	1,257	\$479,394,702	376	\$943,979,928
Sweden (T)	3,465	\$1,858,369,017	\$1,543,889,219	\$3,402,258,236	2,060	\$938,121,236	1,334	\$1,893,041,495
Webster (T)	16,660	\$6,717,594,859	\$4,792,596,311	\$11,510,191,170	14,331	\$6,253,561,105	2,108	\$3,215,679,437
Webster (V)	1,633	\$1,779,482,826	\$1,854,583,456	\$3,634,066,282	1,344	\$810,221,962	210	\$766,075,242
Wheatland (T)	1,926	\$1,332,809,855	\$1,176,267,185	\$2,509,077,040	1,011	\$555,019,265	676	\$867,892,661
Monroe County (Total)	312,018	\$173,459,265,918	\$141,548,611,980	\$315,007,877,898	246,895	\$100,684,832,147	59,114	\$148,124,778,765

Source: Monroe County GIS - 2022; RS Means - 2022

Notes: C: City T: Town V: Village



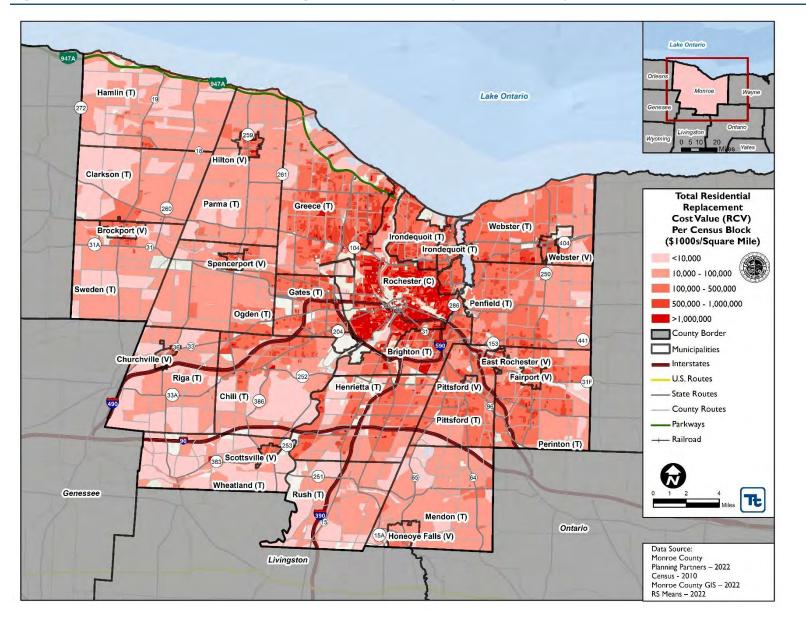


The 2020 Economic Surveys Business Patterns data identified 17,383 business establishments employing approximately 354,169 people in Monroe County. The retail trade industry has the greatest number of establishments in the County, with 2,219. This is followed by the professional, scientific, and technical services industry with 1,943 establishments, and the health care and social assistance industry with 1,931 establishments (Census 2020).

Figure 4-11 through Figure 4-13 show the distribution and exposure density of residential, commercial, and industrial buildings in Monroe County based on the New York State Department of Taxation and Finance Property Class Code. Exposure density is the dollar value of structures per unit area, including building content value. The densities are shown in units of \$1,000 (\$K) per square mile. Viewing exposure distribution maps, such as those used for Figure 4-11 through Figure 4-13, can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.



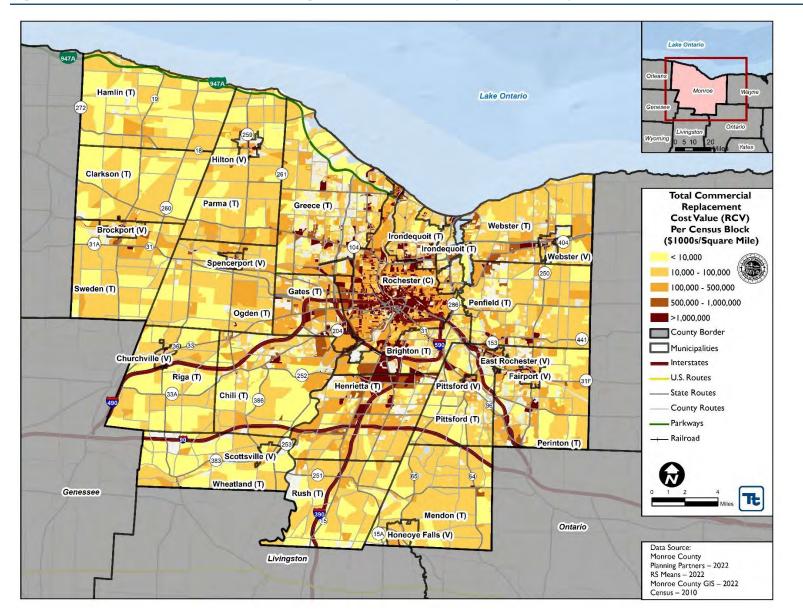








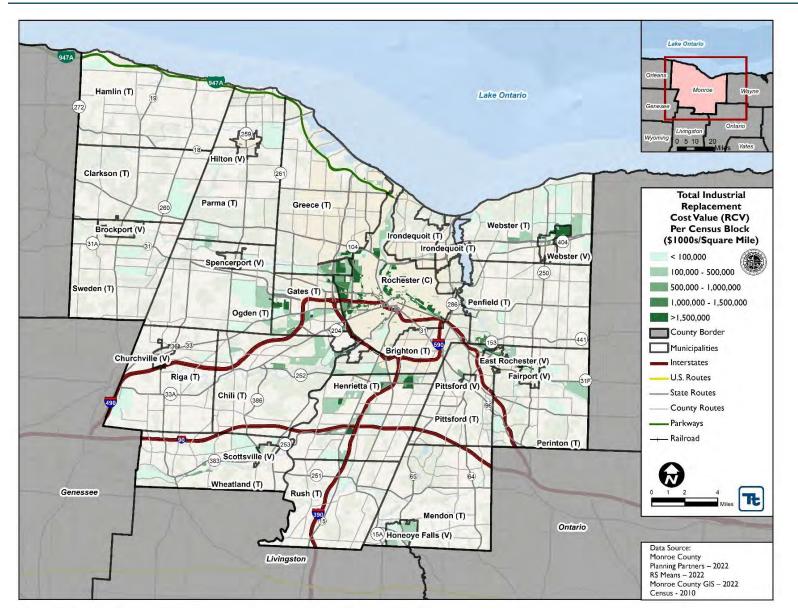


















4.4 Land Use and Population Trends

In New York State, land use regulatory authority is vested in towns, villages, and cities. However, many development and preservation issues transcend local political boundaries. DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use trends can also significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

This section provides a general overview of land use and population trends, and types of development occurring within the County. An understanding of these development trends can assist in planning for further development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure.

4.4.1 Land Use Trends

Monroe County is an urbanizing County, and the most populated County in the nine-county Genesee/Finger Lakes region. Monroe County contains major employers, human services providers, schools and colleges, retail and service businesses, recreational sites, and tourist attractions. Most County and state facilities, as well as regional and national retailers, are located in and around the City of Rochester. The County is home to two Fortune 500 companies – Kodak and Xerox – both of which have significant holdings and operations in the County. The headquarters of both Kodak and Bausch & Lomb, widely known for high quality optical equipment, are located in the City of Rochester. Agriculture is also a major business in Monroe County.

Agriculture

Agriculture in Monroe County has undergone significant changes in recent decades as expanding non-farm development put pressure on landowners for farmland conversion, profitability of certain agricultural markets decreased, and more. According to the 2017 Census of Agriculture, the number of farms in Monroe County has increased 11 percent, total farmland is up 8 percent, and the average size of each farm is down 2 percent since 2012. Between 2012 and 2017, the number of farms increased from 475 to 527, for a total reduction of land in farms of 8,102 acres. However, the market value of products sold in the Monroe County agricultural economies decreased by 15 percent between 2012 and 2017. Combined with an increased number of farms operating, this marked a 24 percent decrease in average market value of products sold per farm (USDA 2017).

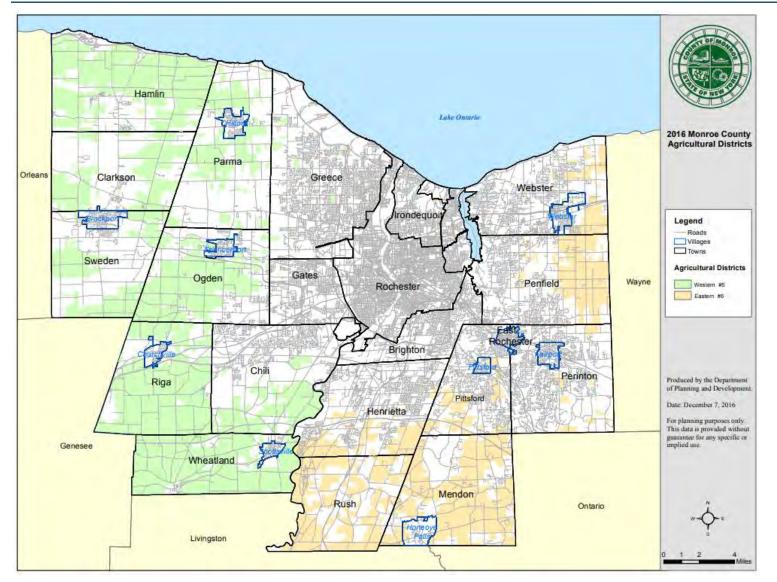
The County has a well-developed vegetables, melons, potatoes, and sweet potatoes sector, and is ranked sixth in the state on value of sales by this commodity group. Additionally, Monroe County ranks eighth in the state, and 98th in the nation, for the value of its cut Christmas trees and short rotation woody crops sales (USDA 2017).

Article 25AA of the New York State Agriculture and Markets Law, titled Agricultural Districts, provides counties with the opportunity to create agricultural districts for the purpose of protecting and promoting the agriculture industry. Once created, the law requires that each district must be reviewed on an eight-, ten-, or twelve-year basis to see if it is still achieving its intended purpose. In Monroe County, districts are reviewed every eight years. Monroe County has two agricultural districts. The Western Agricultural District (#5) consists of the Towns of Chili, Clarkson, Gates, Greece, Hamlin, Ogden, Parma, Riga, Sweden, and Wheatland and has a total acreage of 94,077 acres. The Eastern Agricultural District (#6) consists of the Towns of Henrietta, Mendon, Perinton, Penfield, Pittsford, Rush, and Webster and has a total acreage of 47,673 acres (Monroe County 2022).









Source: Monroe County Department of Planning and Development 2016



Economy

Monroe County's economy is developing into a more diverse economy focused on high-technology industry, education, health care, and a growing small and mid-sized business sector. This transformation reflects the national trend from manufacturing. Locally, significant losses in manufacturing have been offset by gains in other sectors, particularly education and financial activities (ACT Rochester 2022).

The Educational Services and Financial Activities in the region grew between 2001 and 2020 (37 percent and 29 percent), while jobs in the Manufacturing and Information sectors declined (39 percent and 51 percent respectively). The Trade, Transportation, and Utilities sector provided the most jobs in the region at 16 percent of the total in 2020, followed by Health Care and Social Assistance and Professional and Business Services sectors making up 14 percent and 13 percent of the total (ACT Rochester 2022).

The average salary in 2020 in the region of \$55,100 was below the state (\$83,100) and national (\$64,000) figures. All sectors have wages below state figures, and the rate of increase in average salary has consistently lagged in comparison since 2004 (ACT Rochester 2022).

4.4.2 Population Trends

This section discusses population trend information used to estimate future shifts that could significantly change the character of the area. Population trends can provide a basis for making decisions on the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support planning decisions regarding future development in vulnerable areas.

As seen in Table 4-6, Monroe County's population has increased over most decades since 1960. However, the population projections for Monroe County from Cornell University for the next two decades anticipate a peak in population around 2030, followed by a slight drop in population as seen in Table 4-7.

Population and				Historical			
Projections	1960	1970	1980	1990	2000	2010	2020
Monroe County	586,387	711,917	702,238	713,968	735,343	744,344	753,109
Town of Brighton	27,849	35,065	35,776	34,455	35,588	36,609	37,137
Town of Chili	11,237	19,609	23,676	25,178	27,638	28,625	29,123
Town of Clarkson	2,339	3,642	4,016	4,417	5,928	6,588	6,904
Village of Brockport	5,256	7,878	9,776	8,849	8,103	8,366	7,104
T/V of East Rochester	8,152	8,347	7,596	6,932	6,650	6,587	6,334
Town of Gates	13,755	26,442	29,756	28,583	29,275	28,400	29,167
Town of Greece	48,670	75,136	81,367	90,106	94,141	96,095	96,926
Town of Hamlin	2,755	4,167	7,675	9,203	9,355	9,045	8,725
Town of Henrietta	11,598	33,017	36,134	36,376	39,028	42,581	47,096
Town of Irondequoit	55,337	63,675	57,648	52,377	52,354	51,692	51,043
Town of Mendon	1,759	2,293	3,024	4,505	5,775	6,478	6,389
Village of Honeoye Falls	2,143	2,248	2,410	2,340	2,595	2,674	2,706
Town of Ogden	4,801	8,807	11,269	13,306	14,933	16,255	16,585
Village of Spencerport	2,461	2,929	3,424	3,606	3,559	3,601	3,685
Town of Parma	4,943	8,308	8,434	8,657	8,966	9,747	10,190
Village of Hilton	1,334	2,440	4,151	5,216	5,856	5,886	6,027
Town of Penfield	12,601	23,782	27,201	30,219	34,645	36,242	39,438
Town of Perinton	7,593	21,609	32,359	37,072	40,350	41,109	39,128
Village of Fairport	5,507	6,474	5,970	5,943	5,740	5,353	5,501
Town of Pittsford	8,469	18,441	21,052	23,009	25,801	28,050	25,714
Village of Pittsford	1,749	1,755	1,568	1,488	1,418	1,355	1,419
Town of Riga	1,797	2,681	2,910	3,383	3,550	3,629	3,495
Village of Churchville	1,003	1,065	1,399	1,731	1,887	1,961	2,091
City of Rochester	318,611	296,233	241,741	231,636	219,773	210,565	211,328
Town of Rush	2,555	3,287	3,001	3,217	3,603	3,478	3,490

Table 4-6. Population Growth in Monroe County





Population and		Historical								
Projections	1960	1970	1980	1990	2000	2010	2020			
Town of Sweden	1,968	3,583	5,083	5,432	5,757	5,957	6,140			
Town of Webster	13,374	19,702	23,426	26,175	32,710	37,242	39,676			
Village of Webster	3,060	5,037	5,499	5,464	5,216	5,399	5,651			
Town of Wheatland	1,848	2,298	3,108	3,181	3,021	2,774	2,888			

Source: Genesee/Finger Lakes Regional Planning Council 2013; US Census 2020

Table 4-7. Population Growth in Monroe County

Population		Historical								
and Projections	1960	1970	1980	1990	2000	2010	2020	2030	2040	
Monroe County	586,387	711,917	702,238	713,968	735,343	744,344	753,109	758,536	751,581	

Source: Genesee/Finger Lakes Regional Planning Council 2013; US Census 2020; Cornell PAD projections 2018

4.5 Lifelines and Critical Facilities

Critical infrastructure and facilities are those that are essential to the health and welfare of the population. These facilities are especially important after any hazard event. Critical facilities are those that maintain essential and emergency functions and are typically defined to include police and fire stations, schools, and emergency operations centers. Critical infrastructure can include the roads and bridges that provide ingress and egress and allow emergency vehicles access to those in need and the utilities that provide water, electricity, and communication services to the community. Also included are Tier II facilities (hazardous materials) and rail yards; rail lines hold or carry significant amounts of hazardous materials with a potential to impact public health and welfare in a hazard event (FEMA 1997).

Critical Facilities are those facilities considered critical to the health and welfare of the population and that are especially important following a hazard. As defined for this HMP, critical facilities include transportation systems, lifeline utility systems, high-potential loss facilities, and hazardous material facilities, and essential facilities

Essential facilities are a subset of critical facilities that include those facilities that are important to ensure a full recovery following the occurrence of a hazard event. For the county risk assessment, this category was defined to include police, fire, EMS, schools/colleges, shelters, senior facilities, and medical facilities.

Lifelines enable the continuous operation of critical business and government functions and are essential to human health and safety or economic security.

Beginning in 2017, FEMA developed a new construct to increase effectiveness for disaster operations and position response to catastrophic incidents. This construct, known as "community lifelines", represents the most fundamental services in the community that, when stabilized, enable all other aspects of society. Following a disaster event, intervention is required to stabilize community lifelines. Lifelines are divided into seven categories which include:

- Safety and Security
- Food, Water, Shelter
- Health and Medical
- Energy (Power and Fuel)
- Communications
- Transportation
- Hazardous Materials

To facilitate consistency with the National Response Framework, FEMA Strategic Plan, and guidance for the Building Resilient Infrastructure and Communities grant program, critical facilities in Monroe County are discussed in terms of lifelines.





A comprehensive inventory of critical facilities and lifelines in Monroe County was developed from various sources including input from the Steering Committee and Planning Partnership. The inventory of critical facilities presented in this section represents the current state of this effort at the time of publication of the HMP and was used for the risk assessment in Section 5 (Risk Assessment).

4.5.1 Safety and Security

This section provides information on Safety and Security lifelines. Components of this lifeline category include law enforcement/security, fire services, search and rescue services, government services, and community safety (e.g., dams) (Figure 4-15).

Emergency Facilities

The Monroe County Office of Emergency Management (OEM) is organized into four main tiers: Operations, Planning, Logistics, and Administrative/Financial. The operations tier includes all emergency operations including police, fire/EMS, public works, transportation, and sheltering. The OEM is responsible for aiding communities in emergency planning and response, as well as providing the training and equipment for the county's first responders and volunteers. OEM operates an Emergency Operations Center in the City of Rochester, which is a specially designed facility where public organizations and private-sector agencies meet to decide and coordinate emergency response to community-wide disasters. Additionally, the OEM funds a 24-hour 9-1-1 Center and oversees the operation of the Emergency Communications Department (ECD), operated by the City of Rochester under contract with the County.

The OEM develops, maintains, and executes Monroe County's Comprehensive Emergency Management Plan for disaster relief before, during, and after any type of natural or man-made disaster (or a war-time situation). The OEM also assists towns and villages in the preparation of their emergency response plans. With guidance from FEMA, OEM develops and continually reviews the Monroe County Radiological Emergency Preparedness Plan (MCREPP) in case of an incident at the Ginna nuclear power plant, and conducts multiple exercises annually to test its REPP.

There are 90 fire department facilities in Monroe County serving the County's municipalities. Police enforcement and public safety is maintained by the New York State Police Department, Monroe County Police, and local departments. The Monroe County Sheriff's Office operates two jails and six stations; it also has three boats. The Sheriff's Office patrols towns within Monroe County that do not have their own police patrols and is responsible for primary police patrols at the Greater Rochester International Airport as well as the many parks throughout the County.

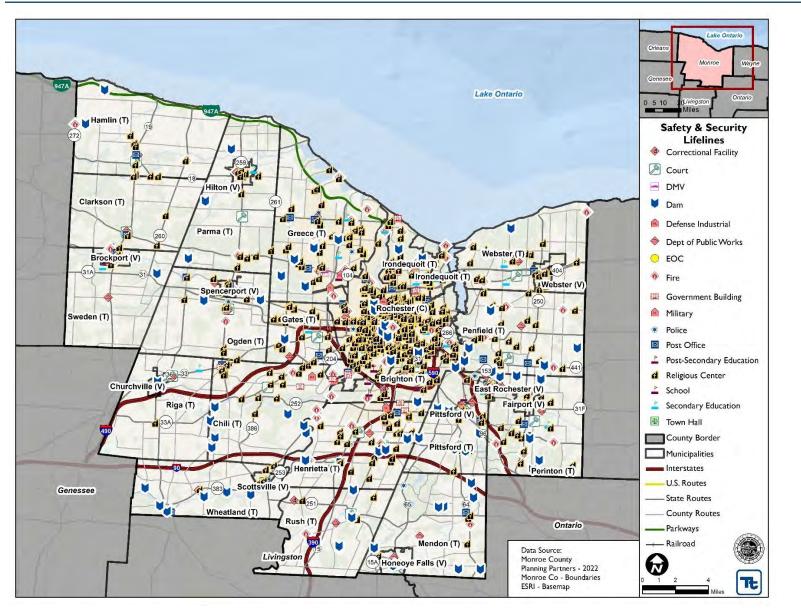
Figure 4-15 displays the location of emergency facilities in Monroe County.





ŦŁ







Hospitals and Medical Facilities

The County has multiple hospitals and health care facilities ranging in size and primary function to include smaller community health centers and the larger, regional Strong Memorial Hospital. Hospitals in Monroe County consist of three "systems" – University of Rochester Medical Center, including Strong Memorial Hospital and Highland Hospital; Rochester General Health System, including Rochester General Hospital; and Unity Health System, including Unity Hospital (former Park Ridge Hospital) and the Genesee Street campus (formerly St. Mary's Hospital). All three systems have associated nursing homes, health centers or clinics, and hospital-sponsored medical practices (Monroe County 2017).

Monroe County is also served by a network of federally qualified Community Health Centers (FQHCs) – Jordan, (sites at Holland Street, Woodward, and Brown Square) and Oak Orchard. Inner-city Rochester FQHCs include Clinton Family Health Center, Genesee Health Center, Northeast Health Services, Orchard Street Community Health Center, and Unity Family Medicine Center. St. Joseph's Neighborhood Center and the Mercy Outreach Center, also in the city, are free clinics primarily serving individuals who are uninsured (Monroe County 2017).

For non-emergency health care needs, a number of "urgent care centers" are located throughout the County. Some of these clinics are open 24 hours per day, and most have evening and weekend hours. There are 21 urgent care facilities in the County. The County also has 33 alcohol/drug treatment facilities.

Figure 4-16 displays the location of hospitals and medical facilities in Monroe County.

Schools

There are 255 public and private primary educational facilities (elementary, middle, and high schools) and 17 secondary educational facilities (colleges and universities) located in Monroe County. In times of need, schools can function as shelters and are an important resource to the community. For information regarding shelters, see the Shelters subsection of this document below.

Senior Care and Living Facilities

The County has an extensive system of programs and services for the senior population, including 41 adult care, 33 nursing homes, and 69 Home Care Providers (New York State n.d.). These facilities are highly vulnerable to potential impacts from disasters and knowing the location and numbers of these types of facilities will be effective in managing a response plan pre- and post-disaster. Figure 4-16 displays the location of senior care and living facilities in Monroe County.

Shelters

With support and cooperation of the American Red Cross and local jurisdictions, the county references an inventory of suitable shelter locations and can assist with the coordination and communication of shelter availability as necessitated by the execution of local municipal emergency operation plans. County-wide sheltering policies and procedures are documented in the following plans, which are maintained by the Monroe County OEM:

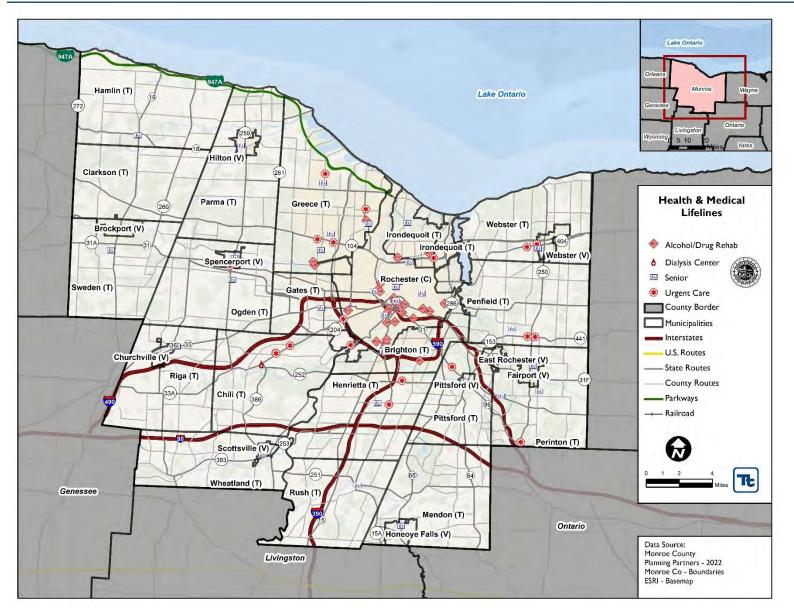
- Monroe County Comprehensive Emergency Management Plan
- Monroe County Comprehensive Emergency Management Plan, Mass Sheltering Plan Annex
- Monroe County Radiological Emergency Preparedness Plan (MCREPP)

The County also has 15 homeless shelters facilities.













Evacuation Routes

The County has identified evacuation zones for severe weather, maintains specific evacuation plans for radiological emergencies associated with the Ginna Nuclear Power Plant, and can assist with the coordination and communication of evacuation routing as necessitated by the execution of local municipal emergency operation plans.

4.5.2 Transportation Systems

Monroe County's location and extensive transportation network offer residents and employees' various options for transportation throughout the county and the region. The transportation system includes an extensive network of roads, access to national and commuter rail, countywide bus service, an airport providing domestic and international flights, and a commercial shipping port. Major transportation routes through Monroe County include Interstate Routes 90, 490, 590, 390, and 531 and navigable waterways including the Erie Canal and Lake Ontario.

There are 4,648 miles of roadway in Monroe County. The County Department of Transportation is responsible for roughly 1,500 miles of county-owned highways, 180 bridges, and 275 major culverts, and 805 traffic signal and flasher devices as part of the Monroe County highway system (Monroe County 2022).

Interstates (I)-90, I-390, I-490 and I-590 are the primary routes of travel through Monroe County. I-90 traverses the County from the east to the west through the southern section, passing through the Towns of Wheatland, Chili, Henrietta, Pittsford, and Mendon. In the Town of Henrietta, I-90 intersects with I-390, which is a major north-south route carrying traffic up from Livingston County and other points south. I-390 bisects Monroe County, skirting the City of Rochester to the west and ending near the shores of Lake Ontario where the road continues as the Lake Ontario State Parkway. I-490 is the third major route option and is an auxiliary highway offering a direct route into the City of Rochester from where it splits from I-90 on both the southeastern and southwestern corners of the County. I-490 runs along the original path of the Eire Canal through the City of Rochester; it also serves the Villages of Churchville and Pittsford, among others. I-490 connects with I-390 and New York State Route 390/NY 390 just west of the City of Rochester, and with I-590/NY 590 to the east of Rochester. Together, these roads comprise the southernmost portion of the Inner Loop Beltway, which circles around the interior of Rochester. State Route 531 connects I-490 to western suburbs including the Towns of Ogden and Gates, and the Villages of Brockport and Spencerport.

Additionally, State Routes 104, 33, 31, and 36 connect the County to its eastern western, and southern neighbors. SR 104 and SR 31 run east west through the northern and central section of the County, respectively. SR 36 begins at the terminus of SR 531 in the Town of Ogden and runs south through the Town of Riga and Wheatland before connecting with Livingston County. SR 33 connects SR 31 in the City of Rochester directly to the City of Buffalo to the west. SR 33 is mostly a rural highway serving local traffic and it often parallels I-490. Figure 4-17 displays the location of transportation lifelines in Monroe County.

Bus and Other Transit Facilities

Residents of Monroe County have the option of using public transportation through the Regional Transit Service (RTS), the largest subsidiary of the Rochester Genesee Regional Transportation Authority (RGRTA), which includes 216 buses and 41 fixed routes serving a population of nearly 750,000 throughout Monroe County and the surrounding region. RTS provides affordable public transportation to urban, suburban, and rural areas, as well as complimentary paratransit service throughout the region, and currently serves a ridership of over 14 million (RGRTA 2020).





Railroad Facilities

There are two types of rail systems in Monroe County: freight and passenger. There are a total of 10 junctions or freight stations throughout the Rochester area, including Charlotte Yard in the north, Goodman St. Yard in the east, West Ave. Yard near the city center, and Brooks Ave. Yard along the city's southwestern border. These stations and yards serve a number of transportation and freight companies, including CSX Transportation, Inc. (CSXT); CSXT Amtrak; Livonia, Avon & Lakeville Railroad Corp (LAL); and Rochester & Southern Railroad (RSR). As these lines spread out from Rochester, they provide passenger and freight rail at points in Webster (Ontario Midland Railroad Corp [OMID]), Fairport (CSXT Amtrak), Henrietta (LAL), and Chili (CSXT Amtrak and CSXT) (NYS DOT 2019).

Amtrak provides passenger service from Chicago to Washington DC, and also connects through the City of Rochester. The Rochester station is located along Amtrak's Empire Service and provides regional service to New York City, Albany, Syracuse, Buffalo, and Niagara Falls (Amtrak 2022).

The Rochester & Southern Railroad (RSR), owned and operated by Genesee & Wyoming (G&W), is a 58-mile short line freight railroad that interchanges with the Buffalo & Pittsburgh Railroad; Canadian National; Canadian Pacific; CSX Transportation; Livonia, Avon & Lakeville Railroad; and Norfolk Southern. RSR tracks originate in the City of Rochester, sending one line to Buffalo where it connects with a larger network of G&W trains to points south and west; and another to a terminus in Dansville, south of Rochester. Commodities transported by rail include aggregates, brick and cement, chemicals, coal, food and feed products, forest products, and steel and scrap (GWRR 2015).

Airports

The Greater Rochester International Airport (ROC) is located 4 miles southwest of downtown Rochester and 12 miles south of Lake Ontario. The airport is the fifth busiest airport in the state of New York and is home to the 642nd Aviation Support Battalion, part of the 42nd Infantry Division. The airport contains a 380,000-square-foot terminal with 22 passenger gates. The airport serviced over 1.5 million passengers in 2021 (US DOT n.d.).

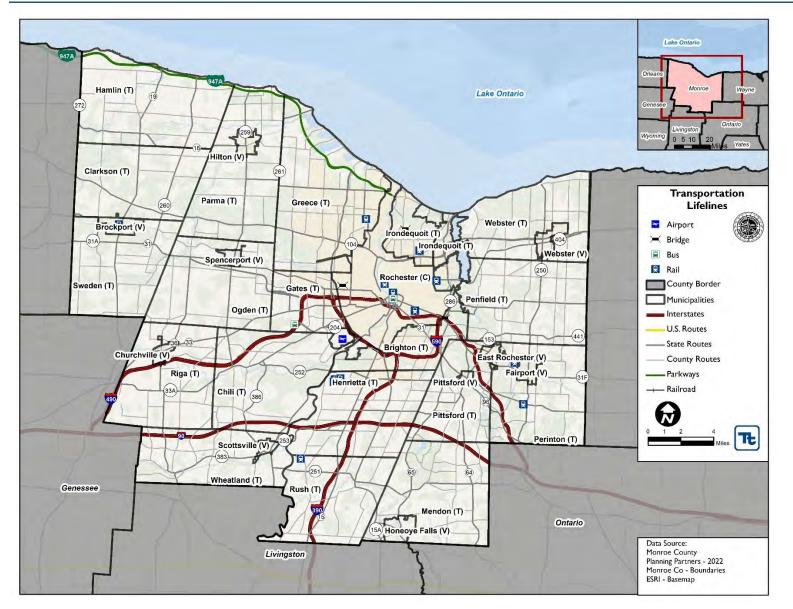
Ferry Service and Ports

The Rochester-Monroe County Port Authority operates a small deep draft commercial harbor at the Genesee River's confluence with Lake Ontario, serving commercial shipping traffic at depths up to 24 feet across a 2.7-mile stretch that includes the Lake Ontario approach, harbor entrance, and Genesee River federal channels. Major partners and operators at port include the Port of Rochester, U.S. Coast Guard, Essroc Cement Corporation and Shellet-Genesee Shipping Group. The Rochester Harbor enables transportation of important commodities and supports \$26.8 Million in business revenue, 142 jobs, and \$7.4 Million in labor income (USACE 2021).













4.5.3 Lifeline Utility Systems

This section presents data and information on potable water, wastewater, energy resource, and communication utility systems. Due to heightened security concerns, local utility lifeline data sufficient to complete the analysis have only partially been obtained.

Potable Water

In Monroe County, water is provided from various facilities as a public service or through private supplies, such as wells. Community water suppliers serve most of the county's population while a small portion of the population relies on on-site wells. Figure 4-19 shows the location of water treatment and distribution facilities in Monroe County.

Monroe County's public water supply comes from Lake Ontario, two of the Finger Lakes (Hemlock Lake and Canadice Lake), and from private wells (Monroe County Department of Health 2019). There are two producers of public drinking water within Monroe County: Monroe County Water Authority (MCWA) and City of Rochester Bureau of Water and Lighting. The MCWA is the third largest water supplier in New York State and produces and delivers an average of 20 billion gallons of drinking water every year (MCWA 2021). The Villages of Brockport and Hilton, as well as the Seabreeze Water District community in the Town of Irondequoit, purchase water from MCWA for re-sale to their customers.

Water treatment facilities and distribution systems are not identified for security purposes. Many of the rural areas are dependent on private wells. Several large industries have their own supply source and treatment facilities. Many fire departments have an alternate water source for firefighting. For instance, the City of Rochester has a parallel supply for fire suppression within the downtown area called the "Holley System," and many suburban and rural departments have standpipes on natural waterways.

Water from Lake Ontario, its primary source, is treated at MWCA's Shoremont plant in the Town of Greece and another plant in the Town of Webster. MCWA also operates the Corfu plant, which is a small well supply in the Village of Corfu in Genesee County, and purchases water from the City of Rochester and the Erie County Water Authority (ECWA) (MCWA 2021).





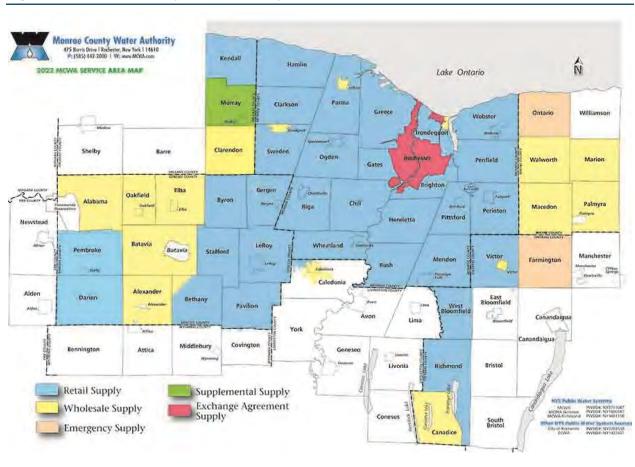


Figure 4-18. Monroe County Water Authority Service Area

Wastewater Facilities

The Monroe County Division of Pure Waters was established by the County's legislature to implement the 1969 Pure Waters Master Plan to reduce the levels of pollution in Irondequoit Bay, the Genesee River, areas of Lake Ontario, and other waters of Monroe County to safe and healthy levels. Today, the County's four sewer districts contain several miles of major interceptor tunnel, two wastewater treatment facilities, pump stations and the sewer collection systems for the Rochester and Gates-Chili-Ogden districts (Monroe County Pure Waters 2022).

The sewer system operated by Monroe County is spread over four sewer districts (Northwest, Gates Chili Ogden, Rochester, and Irondequoit Bay) and serves a population of over 500,000 people. Collection sewers in other districts are operated, maintained, and funded by local municipalities. The districts obtain the majority of their revenue from user charges. In Monroe County, wastewater is collected by a system of underground pipes, or sewers, which carry it to wastewater treatment facilities (WWTF).

Monroe County contains five treatment facilities, most of which are located near bodies of water into which the treated wastewater is discharged. Other wastewater treatment plants that discharge into the Genesee River include those from the Village of Honeoye Falls and Kodak's King's Landing. The County's VanLare and Northwest Quadrant plants are located on the south shore of Lake Ontario. The VanLare plant, first opened in 1916, is the largest WWTF in the County with a permitted flow of 135 million gallons per day (mgd). The



Source:
 MCWA 2022

 Note:
 Monroe County is indicated with the dashed black line.



VanLare plant is capable of handling 660 mgd during storm events. The Northwest Quadrant facility is located in the Town of Hilton and has an operating permit for flow of 22 mgd and handles 14 mgd of primarily residential wastewater (Rochester Subway 2022). Figure 4-19 shows the location of wastewater facilities in Monroe County.

Energy Resources

Gas and electric power in Monroe County are transmitted and distributed by three companies: Rochester Gas and Electric Corporation (RG&E), New York State Gas and Electric Corporation (both Avangrid companies), and National Grid. Homes in the County are heated by many different sources, with a majority using utility gas or fuel oil. In addition, there are three municipal electric providers and one municipal natural gas provider. Some areas are dependent on residential propane tanks for gas service. Figure 4-20 displays the location of energy lifelines in Monroe County.

Communications

Monroe County is served by a variety of communications systems, including traditional land line, fiber optic, and cellular service provided by multiple companies, such as Verizon, Direct TV, and Time Warner and Frontier Communications. Each carrier has individual plans for emergency situations during hazard events and post-disaster recovery efforts. In addition to land line, fiber optic and cellular communications systems, Monroe County has an extensive radio communications network that is utilized by emergency services agencies, hospitals, law enforcement, public works, transportation, and other supporting organizations. There are 61 communication facilities in Monroe County identified as critical facilities. Figure 4-21 displays the location of these facilities.







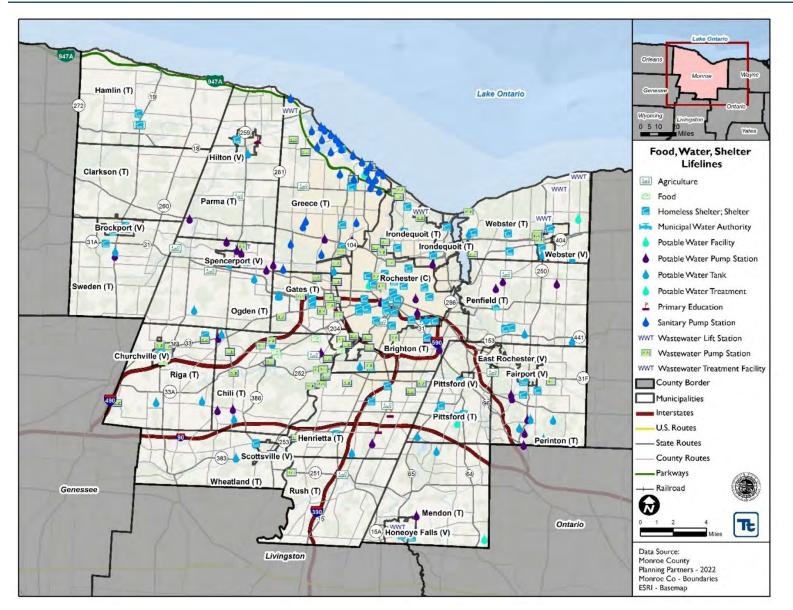
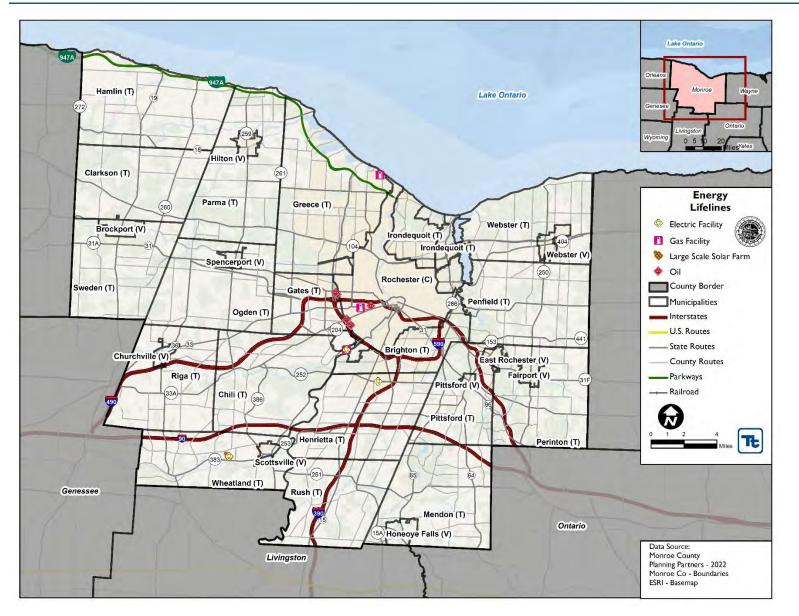






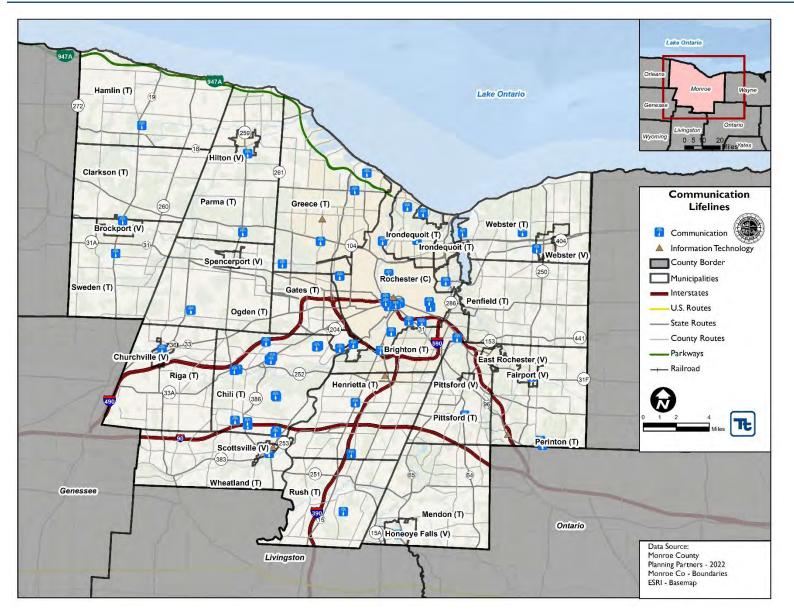
Figure 4-20. Energy Lifelines in Monroe County















4.5.4 High-Potential Loss Facilities

High-potential loss facilities include dams, levees, hazardous materials (HAZMAT) facilities, nuclear power plants, and military installations. The Ginna Nuclear Power Station is located in Wayne County near the northeastern border of Monroe County. Dams are also discussed below.

Military Installations

The 42nd Infantry Division and 53rd Troop Command of the National Guard have guardsmen that report to locations throughout the county. The only other noteworthy military installation in the County is a U.S. Coast Guard station near Lake Ontario and the Genesee River.

HAZMAT Facilities

The U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) (Superfund) Public Access Database (CPAD) reports that there are currently no Superfund sites in Monroe County. Superfund sites are polluted locations requiring a long-term response to clean up hazardous material contaminations.

Abandoned hazardous waste sites placed on the federal National Priorities List (NPL) include those that the EPA has determined present "a significant risk to human health or the environment," with the sites being eligible for remediation under the Superfund Trust Fund Program. As of 2022, Monroe County has no inactive hazardous sites in the federal Superfund Program that are listed on the NPL (CERCLIS 2021).

In addition to the hazardous waste sites, there are numerous hazardous facilities in Monroe County cataloged by the NYS DEC's Bulk Storage Program Database. The Bulk Storage Program includes three types of facilities: Petroleum Bulk Storage (PBS), Major Oil Storage Facilities (MOSF), and Chemical Bulk Storage (CBS). Registration with NYS DEC is mandatory for all PBS facilities with a total storage capacity of 1,100 gallons or more; all CBS underground tanks and all stationary aboveground tanks with a capacity of 185 gallons or more; and all MOSF sites storing more than 400,000 gallons of petroleum products. As of August 2022, there are roughly 2,100 sites in the DEC's Bulk Storage Program Database in Monroe County, NY (NYS DEC 2022).

Dams and Levees

According to the NYSDEC Division of Water Bureau and Flood Protection and Dam Safety, there are three hazard classifications of dams in New York State. The dams are classified in terms of potential for downstream damage if the dam were to fail. The hazard classifications are as follows:

- Low Hazard (Class A) is a dam located in an area where failure will damage nothing more than isolated buildings, undeveloped lands, or township or county roads and/or will cause no significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life. Losses are principally limited to the owner's property
- *Intermediate Hazard (Class B)* is a dam located in an area where failure may damage isolated homes, main highways, and minor railroads; interrupt the use of relatively important public utilities; and will cause significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Class B dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
- *High Hazard (Class C)* is a dam located in an area where failure may cause loss of human life; serious damage to homes, industrial, or commercial buildings; important public utilities; main highways or railroads; and will cause extensive economic loss. This is a downstream hazard classification for dams





in which excessive economic loss (urban area including extensive community, industry, agriculture, or outstanding natural resources) would occur as a direct result of dam failure (NYS DEC n.d.).

According to the USACE National Inventory of Dams (NID), there are 31 dams located within Monroe County with 14 listed as high hazard, 9 listed as significant hazard, and 8 listed as low hazard (USACE n.d.). For the purpose of this plan, the NYSDEC data from the New York State GIS Clearinghouse will be used. According to the GIS data, there are 81 dams located in Monroe County (9 high hazard, 6 intermediate hazard, 43 low hazard, and 23 negligible or no hazard dams). According to the National Levee Database maintained by USACE, there are no levees in Monroe County (USACE n.d.). Refer to Appendix H for the names and locations of the dams found in the County.

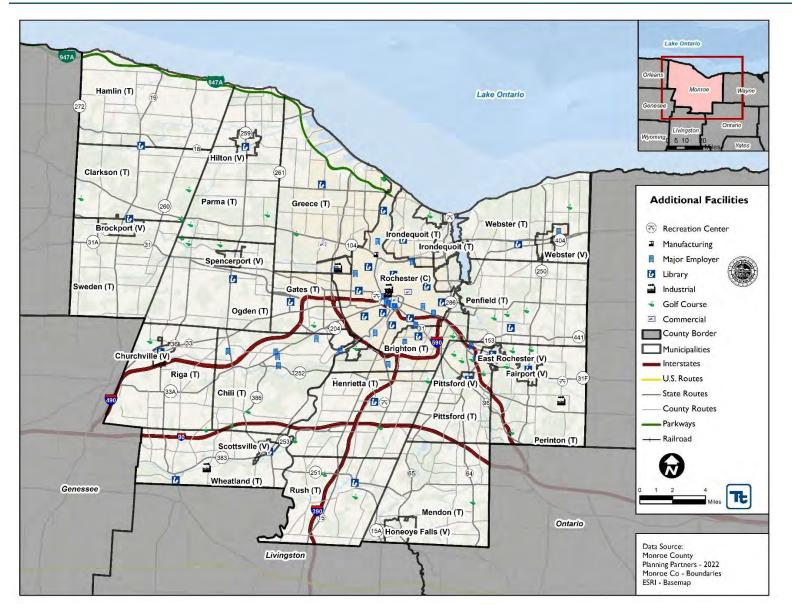
4.5.5 Other Facilities

The Planning Partnership also identified additional critical facilities including municipal buildings, government facilities, major employers, and more. These facilities were included in the risk assessment conducted for the County. Figure 4-22 shows the locations of these facilities in the County.





Figure 4-22. Other Facilities in Monroe County







SECTION 5. RISK ASSESSMENT

A risk assessment is the process of measuring the potential loss of life, personal injury, and economic and property damage resulting from identified hazards. Identifying potential hazards and vulnerable assets allows planning personnel to address and reduce hazard impacts, and allows emergency management personnel to establish early response priorities. Results of the risk assessment are used in subsequent mitigation planning processes, including determining and prioritizing mitigation actions that reduce each jurisdiction's risk to a specified hazard. Past, present, and future conditions must be evaluated to most accurately assess risk for the county and each jurisdiction. The process focuses on the following elements:

- **Hazard identification**—Use all available information to determine what types of hazards may affect a jurisdiction.
- **Profile each hazard**—Understand each hazard in terms of:
 - Extent—Severity of each hazard.
 - Location—Geographic area most affected by the hazard.
 - Previous occurrences and losses
 - Impacts of Climate Change
 - Probability of Future Hazard Events
- Assess Vulnerability
 - Exposure identification—Estimate the total number of assets in the jurisdiction that are likely to experience a hazard event if it occurs by overlaying hazard maps with the asset inventories.
 - Vulnerability identification and loss estimation—Assess the impact of hazard events on the people, property, economy, and lands of the region, including estimates of the cost of potential damage or cost that can be avoided by mitigation.
 - Future changes that may impact vulnerability—Analyze how demographic changes, projected development and climate change impacts can alter current exposure and vulnerability.

This section presents the Monroe County risk assessment and is outlined as follows:

- Methodology and tools used to conduct the risk assessment
- Identification of hazards of concern that impact Monroe County
- Hazards of concern profiles and vulnerability assessment
- Hazard ranking

5.1 METHODOLOGY AND TOOLS

The Monroe County risk assessment was updated using the following best-available information:

- A new building stock inventory was generated using 2022 building footprints, tax assessor and parcel data provided by Monroe County GIS; and 2022 RSMeans cost adjustment values.
- 2020 Decennial Census Population data and 2016-2020 American Community Survey 5-year Population Estimates were utilized.
- Critical facilities were updated and reviewed by the Planning Partnership and county jurisdictions.
- Lifelines were identified in the critical facility inventory to align with Federal Emergency Management Agency's (FEMA) lifeline definition.
- Hazards-U.S. (Hazus) was used to estimate potential impacts to the flood, wind, and seismic hazards.
- Best-available hazard data were used, as described in this section.

The following sections summarize the asset inventories, methodology and tools used to support the risk assessment process.





5.1.1 Asset Inventories

Monroe County assets were identified to assess potential exposure and loss associated with the hazards of concern. For the HMP update, Monroe County assessed exposure and vulnerability of the following types of assets: population, buildings, critical facilities, lifelines, infrastructure, new development, and the environment. Some assets may be more vulnerable because of their physical characteristics or socio-economic uses. To protect individual privacy and the security of critical facilities, information on properties assessed is presented in aggregate, without details about specific individual personal or public properties. Each asset type is described below.

Population

Total population statistics from the 2020 Decennial Census Population estimate and 2016-2020 American Community Survey (ACS) 5-year estimate were used to estimate the exposure and potential impacts to the county's population in place of the 2010 U.S. Census block estimates. To determine population statistics for



The risk assessment included the collection and use of an expanded and enhanced asset inventory to estimate hazard exposure and vulnerability.

village and towns, village population totals were subtracted from the total town population. Where villages were split between towns, the percentage of the geographic area of the village within each town was calculated and applied to the total population of the village to estimate the population that would be subtracted from each respective town. Population counts at the jurisdictional level were averaged among the residential structures in the county to estimate the population at the structure level. This estimate provides a more precise distribution of population across the county compared to only using the Census block or Census tract boundaries. Limitations of these analyses are recognized, and thus the results are used only to provide a general estimate for planning purposes.

FEMA's Hazus program was used to model estimated potential losses to flood, seismic and wind hazards; as discussed further later in this section. Hazus still contains 2010 U.S. Census data and was used to estimate sheltering and injuries as part of the hazard analysis.

As discussed in Section 4, County Profile, research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. Vulnerable populations in Monroe County included in the risk assessment are children, elderly, population below the poverty level, non-English speaking individuals, and persons institutionalized with a disability.

Buildings

A custom general building stock was created countywide. The general building stock was updated countywide with a custom-building inventory using 2022 building stock footprints provided by Monroe County GIS. The building inventory attributes were updated using 2022 parcel tax assessor information provided by Monroe County GIS. Attributes provided in the associated files were used to further define each structure, such as year built, number of stories, basement type, occupancy class, and square footage. The centroid of each building footprint was used to estimate the building location. Structural and content replacement cost values (RCV) were calculated for each building using the available assessor data, the building footprint, and RSMeans 2022 values. The analysis used a location factor associated by location zip-code, which produced location factors of 1.00 and





1.00 for residential and non-residential occupancy classes, respectively. RCV is the current cost of returning an asset to its pre-damaged condition using present-day cost of labor and materials. Total RCV consists of both the structural cost to replace a building and the estimate value of contents of a building. The occupancy classes available in Hazus were condensed into the categories of residential, commercial, industrial, agricultural, religious, governmental, and educational to facilitate analysis and presentation of results. Residential loss estimates addressed both multi-family and single-family dwellings.

Critical Facilities and Lifelines

A critical facility inventory, which includes essential facilities, utilities, transportation features and user-defined facilities, was created by the Planning Partnership and county jurisdictions. The development involved a review for accuracy, additions, or deletions of new or moved critical assets, identification of backup power for each asset (if known) and whether the critical facility is considered a lifeline in accordance with FEMA's definition (refer to Appendix G, Critical Facilities). To protect individual privacy and the security of

A lifeline provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security (FEMA).

assets, information is presented in aggregate, without details about specific individual properties or facilities.

Environment and Land Use Area

National land use land cover data created by the U.S. Geological Survey (USGS) in 2021 was used to assess land use characteristics of the county. This dataset was converted from a raster to a vector polygon, which informed spatial areas of built and natural land use areas. The built land use areas were defined as urban areas and include developed open space, low, medium, and high intensity locations. Non-urban areas were extracted into agricultural, barren land, forest, rangeland, water, and wetlands land use categories.

New Development

In addition to assessing the vulnerability of the built environment, Monroe County examined recent development over the last 5 years and anticipated new development in the next 5 years. Each jurisdiction was asked to provide a list by address of major development that has taken place within these timeframes. The location of new development projects was submitted via ArcGIS Survey123.

New development was identified as (1) anticipated in the next 5 years and (2) recently developed over the last 5 years. An exposure analysis was conducted in geographic information system (GIS) to determine hazard exposure to these development sites. Projects built on multiple parcels were assessed as one unit. If one parcel identified within the project boundary intersected a spatial hazard layer, the entire project was considered "exposed" to the hazard area of concern.

Identifying these changes and integrating new development into the risk assessment provides communities information to consider when developing the mitigation strategy to reduce these vulnerabilities in the future (one tool in the Mitigation Toolbox discussed in Section 6, Mitigation Strategy. The new development is listed in Section 4, County Profile, and hazard exposure analysis results are presented in Section 9, Jurisdictional Annexes, as a table in each annex.

5.1.2 Methodology

To address the requirements of the DMA 2000 and to better understand potential vulnerability and losses associated with hazards of concern, Monroe County used standardized tools, combined with local, state, and federal data and expertise to conduct the risk assessment. Three different levels of analysis were used depending





upon the data available for each hazard as described below. Table 5.1-1 summarizes the type of analysis conducted by hazard of concern.

- 1. **Historic Occurrences and Qualitative Analysis** This analysis includes an examination of historic impacts to understand potential impacts of future events of similar size. In addition, potential impacts and losses are discussed qualitatively using best-available data and professional judgement.
- Exposure Assessment This analysis involves overlaying available spatial hazard layers, or hazards with defined extent and locations, with assets in GIS to determine which assets are located in the impact area of the hazard. The analysis highlights which assets are located in the hazard area and may incur future impacts.
- 3. Loss Estimation The FEMA Hazus modeling software was used to estimate potential losses for the following hazards: flood, earthquake, and hurricane. In addition, an examination of historic impacts and an exposure assessment was conducted for these spatially-delineated hazards.

Hazard	Population	General Building Stock	Critical Facilities	New Development
Disease Outbreak	Q	Q	Q	Q
Drought	Q	Q	Q	Q
Earthquake	Е, Н	Е, Н	Е, Н	Е
Extreme Temperature	Q	Q	Q	Q
Flood	E, H	E, H	Е, Н	Е, Н
Hazardous Materials	Q	Q	Q	Q
Infestation and Invasive Species	Q	Q	Q	Q
Landslide	Е	Е	Е	Е
Severe Storm	Н	Н	Н	Н
Severe Winter Storm	Q	Q	Q	Q
Wildfire	Е	Е	Е	Е

Table 5.1-1. Summary of Risk Assessment Analyses

Notes: E = Exposure analysis; H = Hazus analysis; Q = Qualitative analysis

Hazards U.S. - Multi-Hazard (Hazus-MH)

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or Hazus. Hazus was developed in response to the need for more effective national-, state-, and community-level planning and the need to identify areas that face the highest risk and potential for loss. Hazus was expanded into a multi-hazard methodology, Hazus with new models for estimating potential losses from wind (hurricanes) and flood (riverine) hazards. Hazus is a GIS-based software tool that applies engineering and scientific risk calculations, which have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

Hazus uses GIS technology to produce detailed maps and analytical reports that estimate a community's direct physical damage to building stock, critical facilities, transportation systems and utility systems. To generate this information, Hazus uses default data for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, and economic impact) depending on the hazard and available local data. Hazus' open data architecture can be used to manage community GIS data in a central location. The use of this software





also promotes consistency of data output now and in the future and standardization of data collection and storage. More information on Hazus is available at <u>http://www.fema.gov/hazus</u>.

In general, modeled losses were estimated in the program using depth grids for the flood analysis and probabilistic analyses were performed to develop expected or estimated distribution of losses (mean return period losses) for hurricane wind and seismic hazards. The probabilistic model generates estimated damages and losses for specified return periods (e.g., 100- and 500-year). Table 5.1-2 displays the various levels of analyses that can be conducted using the Hazus software.

Table 5.1-2. Summary of Hazus Analysis Levels

Hazus Analysis Levels						
Level 1	Hazus provides hazard and inventory data with minimal outside data collection or mapping.					
Level 2	Analysis involves augmenting the Hazus provided hazard and inventory data with more recent or detailed data for the study region, referred to as "local data"					
Level 3	Analysis involves adjusting the built-in loss estimation models used for the hazard loss analyses. This Level is typical done in conjunction with the use of local data.					

Disease Outbreak

All of Monroe County is at risk to impacts from disease outbreaks. Refer to Section 5.4.1 for the qualitative analysis summarizing the county's vulnerability to this hazard of concern.

Drought

All of Monroe County is at risk to impacts from drought events. Refer to Section 5.4.2 for the qualitative analysis summarizing the county's vulnerability to this hazard of concern.

Earthquake

A probabilistic assessment was conducted for Monroe County for the 100-year and 500-year mean return period (MRPs) events through a Level 2 analysis in Hazus to analyze the earthquake hazard and provide a range of loss estimates. The probabilistic method uses information from historic earthquakes and inferred faults, locations, and magnitudes, and computes the probable ground shaking levels that may be experienced during a recurrence period by Census tract.

As noted in the Hazus Earthquake User Manual, "Although the software offers users the opportunity to prepare comprehensive loss estimates, it should be recognized that uncertainties are inherent in any estimation methodology, even with state-of-the-art techniques. Any region or city studied will have an enormous variety of buildings and facilities of different sizes, shapes, and structural systems that have been constructed over a range of years under diverse seismic design codes. There are a variety of components that contribute to transportation and utility system damage estimations. These components can have differing seismic resistance" (FEMA 2020). However, Hazus' potential loss estimates are acceptable for the purposes of this HMP.

Ground shaking is the primary cause of earthquake damage to man-made structures and soft soils amplify ground shaking. One contributor to the site amplification is the velocity at which the rock or soil transmits shear waves (S-waves). The National Earthquake Hazard Reductions Program (NEHRP) has developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from A to E, where A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses. Class D and E NEHRP soils are the two classes most susceptible to amplified ground motion during an earthquake.



An exposure analysis was conducted for the county's assets (population, building stock, critical facilities, and new development) using NEHRP soil data provided by New York State. The exposure analysis focused on soil types that would experience amplified ground motion during an earthquake (i.e., Class D and E). Assets with their centroid in the hazard areas were totaled to estimate the numbers and values vulnerable to these soil types.

Data from New York State were used in Hazus to replace default NEHRP soils. Groundwater was set at a depth of 5 feet (default setting). The default assumption is a magnitude 7.0 earthquake for all return periods. Although damages are estimated at the census tract level, results were presented at the municipal level. Because there are multiple Census tracts that contain more than one jurisdiction, an area analysis was used to extract the percent of each tract that falls within individual jurisdictions. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction.

Damage estimates are calculated for losses to buildings (structural and non-structural) and contents; structural losses include load carrying components of the structure, and non-structural losses include those to architectural, mechanical, and electrical components of the structure, such as nonbearing walls, veneer and finishes, HVAC systems, boils, etc.

Extreme Temperature

All of Monroe County is at risk to impacts from extreme temperature events. Refer to Section 5.4.4 for the qualitative analysis summarizing the county's vulnerability to this hazard of concern.

Flood

The 1- and 0.2-percent annual chance flood events were examined to evaluate the county's risk from the flood hazard. These flood events are generally those considered by planners and evaluated under federal programs such as NFIP.

The following data were used to evaluate exposure and determine potential future losses for this plan update:

- The Monroe County FEMA Effective Digital Flood Insurance Rate Map (DFIRM) dated August 28, 2008
- A depth grid was created by use of base-flood elevation and cross section data from the 2008 effective FEMA Digital Flood Insurance Rate Map (DFIRM) and the 1/3 arc-second Digital Elevation Map (DEM) model provided by the U.S. Geological Survey (USGS); for areas without elevation data from FEMA, those data were generated by use of the HAZUS-MH Enhanced Quick Look tool.

The effective Monroe County FEMA DFIRM published in 2008 was used to evaluate exposure and determine potential future losses. The depth grid generated using the DFIRM and 1/3 arc-second DEM was integrated into the Hazus riverine flood model and used to estimate potential losses for the 1-percent annual chance flood event.

To estimate exposure to the 1-percent- and 0.2-percent annual chance flood events, the DFIRM flood boundaries were overlaid on the centroids of updated assets (population, building stock, critical facilities, and new development). Centroids that intersected the flood boundaries were totaled to estimate the building RCV and population vulnerable to the flood inundation areas. A Level 2 Hazus riverine flood analysis was performed. Both the critical facility and building inventories were formatted to be compatible with Hazus and its Comprehensive Data Management System (CDMS). Once updated with the inventories, the Hazus riverine flood events. A user-defined analysis was also performed for the building stock. Buildings located within the floodplain were imported as user-defined facilities to estimate potential losses to the building stock at the structural level. Hazus calculated the estimated potential losses to the population (default 2010 U.S. Census data across dasymetric





blocks), potential damages to the general building stock, and potential damages to critical facility inventories based on the depth grids generated and the default Hazus damage functions in the flood model.

Hazardous Materials

All of Monroe County is at risk to impacts from hazardous materials. Refer to Section 5.4.6 for the qualitative analysis summarizing the county's vulnerability to this hazard of concern.

Infestation and Invasive Species

All of Monroe County is at risk to impacts from infestation and invasive species. Refer to Section 5.4.7 for the qualitative analysis summarizing the county's vulnerability to this hazard of concern.

Landslide

An exposure assessment was conducted using landslide incidence and landslide susceptibility data from the United States Geological Survey (USGS) to determine the county's risk to the landslide hazard. The county's assets (population, buildings, critical facilities, and new development) were examined to determine if they are built in areas of the low incidence landslide hazard area, moderate incidence landslide hazard area, or moderate susceptibility landslide hazard area. Assets with their centroid located in the hazard area were totaled to estimate the totals and values at risk to impacts from landslides.

Severe Storm

A Hazus probabilistic analysis was performed to analyze the wind hazard losses for Monroe County for the 100and 500-year MRP events. The probabilistic Hazus hurricane model activates a database of thousands of potential storms that have tracks and intensities reflecting the full spectrum of Atlantic hurricanes observed since 1886 and identifies those with tracks associated with Monroe County. Hazus contains data on historic hurricane events and wind speeds. It also includes surface roughness and vegetation (tree coverage) maps for the area. Surface roughness and vegetation data support the modeling of wind force across various types of land surfaces. Default demographic and updated building and critical facility inventories in Hazus were used for the analysis. Although damages are estimated at the census tract level, results were presented at the municipal level. Because there are multiple census tracts that contain more than one jurisdiction, a density analysis was used to extract the percent of building structures that fall within each tract and jurisdiction. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction.

Severe Winter Storm

All of Monroe County is exposed and vulnerable to the winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. Refer to Section 5.4.10 for the qualitative analysis summarizing the county's vulnerability to this hazard of concern.

Wildfire

The Wildland-Urban Interface (Interface and Intermix) obtained through the SILVIS Laboratory, Department of Forest Ecology and Management, University of Wisconsin – Madison, was referenced to delineate wildfire hazard areas. The University of Wisconsin – Madison wildland fire hazard areas are based on the 2010 Census and 2006 National Land Cover Dataset and the Protected Areas Database. For this risk assessment, the high-, medium-, and low-density interface areas were combined and used as the "Interface" hazard areas.





To determine what assets are exposed to wildfire, available and appropriate GIS data were overlaid with the hazard area. Assets with their centroid located in the hazard area were totaled to estimate the totals and values at risk to impacts from a wildfire event.

Considerations for Mitigation and Next Steps

The following items are to be discussed for considerations for the next plan update to enhance the vulnerability assessment:

- All Hazards
 - Create an updated user-defined general building stock dataset using up-to-date parcels, footprints, and RSMeans values.
 - Utilize updated and current demographic data.
- Earthquake
 - Identify unreinforced masonry in critical facilities and privately-owned buildings (i.e., residences) by accessing local knowledge, tax assessor information, and/or pictometry/orthophotos. These buildings may not withstand earthquakes of certain magnitudes and plans to provide emergency response or recovery efforts at these properties can be developed.
- Extreme Temperatures
 - Track extreme temperature data for injuries, deaths, shelter needs, pipe freezing, agricultural losses, and other impacts to determine distributions of most at-risk areas.
- Flood
 - The general building stock inventory can be updated to include attributes regarding first floor elevation and foundation type (basement, slab on grade, etc.) to enhance loss estimates.
 - Conduct a Hazus loss analysis for more frequent flood events (e.g., 10- and 50-year flood events).
 - Conduct a repetitive loss area analysis.
 - Continue to expand and update urban flood areas to further inform mitigation.
 - As more current FEMA floodplain data become available (i.e., DFIRMs), update the exposure analysis and generate a more detailed flood depth grid that can be integrated into the current Hazus version.
- Landslide
 - A pilot study conducted in Schenectady County, NY (Landslide Susceptibility A Pilot Study of Schenectady County, NY) provided a detailed methodology for delineating high-risk landslide areas. This study looked at a variety of environmental characteristics including slope and soil conditions to determine areas at risk to landslide. To coincide with the methodology of that study, the generated slopes were categorized into five classes: 0 to 2 percent; 3 to 7 percent; 8 to 15 percent; 16 to 25 percent; Greater than 25 percent. Should the county determine the need for a more detailed assessment of risk, it could determine steep slope by other percent categorizations. Additional environmental and soil characteristics used in the Schenectady County plan can be collected and used to follow the methodology used to further delineate the county's most at-risk areas.
- Severe Storm
 - The general building stock inventory can be updated to include attributes regarding protection against strong winds, such as hurricane straps, to enhance loss estimates.
 - Integrate evacuation route data that are currently being developed.
- Wildfire





• General building stock inventory can be updated to include attributes such as roofing material or fire detection equipment or integrate distance to fuels as another measure of vulnerability.

5.1.3 Data Source Summary

Table 5.1-3 summarizes the data sources used for the risk assessment for this plan.

Data	Source	Date	Format
Population data	U.S. Census Bureau; American Community Survey 5- Year Estimates	2020	Digital (GIS) format
Building Inventory	Monroe County GIS, Tetra Tech	2022	Digital (GIS) format
Wildfire Hazard Data	University of Wisconsin - Madison	2010	Digital (GIS) format
Critical Facilities and Lifelines	Monroe County Planning Partnership and County Jurisdictions	2022	Digital (GIS) format
Digitized Effective FIRM maps	FEMA	2008	Digital (GIS) format
1-Meter Digital Elevation Model	USGS	2015	TIFF
Landslide Hazard Data	USGS	n.d.	Digital (GIS) format
NEHRP Soil	NYS	n.d.	Digital (GIS) format
Rail Network	NYS DOT	2013	Digital (GIS) format
Road Network	NYS GIS	2020	Digital (GIS) format
New Development Data	Monroe County Planning Partnership and County Jurisdictions	2022	Digital (GIS) Format

Notes: DOT = Department of Transportation

FEMA = Federal Emergency Management Agency

NRCS = Natural Resources Conservation Service

USDA = U.S. Department of Agriculture

USGS = U.S. Geological Survey

Limitations

Loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best-available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

- 1) Approximations and simplifications necessary to conduct such a study
- 2) Incomplete or dated inventory, demographic, or economic parameter data
- 3) The unique nature, geographic extent, and severity of each hazard
- 4) Mitigation measures already employed by the participating municipalities
- 5) The amount of advance notice residents have to prepare for a specific hazard event
- 6) Uncertainty of climate change projections

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. These results do not predict precise results and should be used to understand relative risk. Over the long term, Monroe County will collect additional data and update and refine existing inventories to assist in estimating potential losses.

Potential economic loss is based on the present value of the general building stock using best-available data. The county acknowledges significant impacts may occur to critical facilities and infrastructure as a result of these hazard events causing great economic loss. However, monetized damage estimates to critical facilities and





infrastructure, and economic impacts were not quantified and require more detailed loss analyses. In addition, economic impacts to industry such as tourism and the real-estate market were not analyzed.



5.2 IDENTIFICATION OF HAZARDS OF CONCERN

To provide a strong foundation for mitigation actions considered in Section 6 (Mitigation Strategy) and Section 9 (Jurisdictional Annexes), Monroe County focused on considering a full range of hazards that could impact the area and then identified and ranked those hazards that presented the greatest concern. The hazard of concern identification process incorporated input from the County and participating jurisdictions; review of the New York State Hazard Mitigation Plan (NYS HMP 2019); review of the 2017 Monroe County HMP (2017 Monroe County Hazard Mitigation Plan); research and local, state, and federal information on the frequency, magnitude, and costs associated with the various hazards that have previously or could feasibly impact the region; and qualitative or anecdotal information regarding natural (not man-made) hazards and the perceived vulnerability of the study area's assets to them. Table 5.2-1 documents the process of identifying the natural hazards of concern for further profiling and evaluation. Specific hazards not identified as a hazard of concern for Monroe County will not be further discussed in detail.

Hazards of Concern are those hazards that are considered most likely to impact a community. These are identified using available data and local knowledge.

Natural Hazards are those hazards that are a source of harm or difficultly created by a meteorological, environmental, or geological event.

5.2.1 Changes from 2017 Hazard Mitigation Plan

The 2017 Monroe County Hazard Mitigation Plan did not identify Pandemic as a hazard of concern. Members of the Steering Committee and Planning Partnership identified this hazard as hazards of concern for the 2023 Hazard Mitigation Plan Update.

The Steering Committee re-evaluated the inclusion of Civil Unrest and Terrorism as stand-alone hazards as per the 2017 plan. However, based on the inherent random aspect civil unrest and terrorism, the alignment with preparedness rather than mitigation planning, and the inclusion of these hazards in preparedness plans, it was determined to not include these hazards in the 2023 plan. The Steering Committee also reevaluated Utility Failure as a stand-alone hazard. The Steering Committee determined that utility failure is a cascading hazard associated with severe weather and therefore, has been included by reference in the Extreme Temperature, Flood, Severe Storm, and Severe Winter Storm hazards.

The 2023 Monroe County Hazard Mitigation Plan includes best available data throughout the plan to present an updated understanding of Monroe County's risk.

5.2.2 Hazard Groupings

The Steering Committee approved use of the following hazard event groupings which are the same as those provided by the Federal Emergency Management Agency (FEMA) guidance documents (*FEMA 386-2 Understanding Your Risks, Identifying Hazards and Estimating Losses; Multi-Hazard Identification and Risk Assessment – The Cornerstone of the National Mitigation Strategy; Local Mitigation Planning Handbook*), and with consideration of hazard grouping in the NYS HMP.

A *Drought* is a period characterized by long durations of below normal precipitation. Drought is a temporary irregularity that can affect agriculture, water supply, aquatic ecology, wildlife, and plant life.

An *Earthquake* is the sudden movement of the earth's surface caused by the release of stress accumulated within or along the edge of the earth's tectonic plates, a volcanic eruption, or a man-made explosion.





The *Extreme Temperature* hazard includes both heat and cold events, which can have a significant impact to human health, commercial/agricultural businesses, and primary and secondary effects on infrastructure (e.g., burst pipes and power failure). What constitutes "extreme cold" or "extreme heat" can vary across different areas of the country based on what the population is accustomed to. The 2022 HMP considers the heat island effect that occurs within developed areas.

The *Flood* hazard includes riverine flooding, lakeshore, flash flooding, shallow flooding, ice jam flooding, urban drainage flooding, and dam failure flooding. Inclusion of the various forms of flooding under a general *Flood* hazard is consistent with that used in FEMA's *Multi-Hazard Identification and Risk Assessment* guidance and the NYS HMP.

The *Hazardous Materials* profile includes materials and wastes that are considered severely harmful to human health and the environment, as defined by the U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (also known as Superfund). Many hazardous materials are commonly used substances, which are harmless in their normal uses but are quite dangerous if released.

The *Infestation and Invasive Species* profile includes infestations of native species and invasive species. An infestation is the presence of pest organisms within an area or field, on the surface of a host, or in soil at numbers or quantities large enough to harm, threaten, or otherwise negatively affect native plants, animals, and humans. Invasive species are non-native species that can harm the environment, the economy, or human health.

The *Landslide* hazard includes rock falls, rock topples, rotational slump, transitional slide, earth flows, creep, block slides, debris avalanche, and debris flows.

The *Pandemic* hazard exists when there are more cases of a particular disease than expected in a given area, or among a specific group of people, over a particular period of time. An aggregation of cases in a given area over a particular period, regardless of the number of cases, is called a cluster. In an outbreak or epidemic, it is presumed that the cases are related to one another or that they have a common cause.

The *Severe Storm* hazard includes windstorms that often entail a variety of other influencing weather conditions, including thunderstorms, hail, lightning, and tornadoes. Tropical disturbances (hurricanes, tropical storms, and tropical depressions) are often identified as a type of severe storm. For this HMP update, *Severe Storm* includes thunderstorms, hail, lightning, tornadoes, hurricanes, and tropical storms.

The Severe Winter Storm hazard includes blizzards, ice storms, snowstorms, sleet, and freezing rain.

The *Wildfire* hazard can be defined as any non-structural fire that occurs in the wildland. Three distinct types of wildland fires have been defined and include naturally occurring wildfire, human-caused wildfire, and prescribed fire. They may be highly destructive and become difficult to control. Wildfires result in the disturbance of forest and brush and destruction of real estate and personal property and have secondary impacts on other hazards, such as flooding, by removing vegetation and disturbing watersheds.





Hazard	Is this a hazard that may occur in Monroe County?	If yes, does this hazard pose a significant threat to Monroe County?	Why was this determination made?	Source(s)
Avalanche	No	No	 The 2019 New York State Hazard Mitigation Plan (NYS HMP) identifies avalanche as a hazard of concern. The topography and climate of Monroe County does not support the occurrence of an avalanche. New York State, in general, has a very low occurrence of avalanche events based on statistics provided by National Avalanche Center – American Avalanche Association (NAC-AAA) between 1998 and 2018. Avalanche was identified as a hazard in the NYS HMP, and there have been occurrences in the state; however, there were no occurrences in Monroe County. The Steering Committee and Planning Partnership do not consider the hazard to be a significant concern. 	NYS DHSESNAC-AAA
Civil Unrest	Yes	No	 The 2019 NYS HMP does not identify civil unrest as a hazard of concern for New York State. Monroe County has a history of civil unrest. The Steering Committee and Planning Partnership do not consider terrorism to be a hazard of concern for Monroe County as is addressed in other preparedness plans. 	 Input from Steering Committee and Planning Partnership Monroe County OEM
Coastal Erosion	Yes	Yes	 The NYS HMP identifies coastal erosion as a hazard of concern for New York State. Erosion can impact all of the state's coastal counties along Lake Erie and the Niagara River, Lake Ontario and the St. Lawrence River, Atlantic Ocean and Long Island Sound, Hudson River south of the federal dam in Troy, the East River, the Harlem River, the Kill van Kull and Arthur Kill, and all connecting waterbodies, bays, harbors, shallows, and wetlands. Although Monroe County has a coastline along Lake Ontario, coastal erosion was not identified as a significant concern by the Planning Committee. Coastal erosion is briefly discussed in the "Flood" profile. The Steering Committee and Planning Partnership do not consider the hazard to be a significant concern. 	 NYS DHSES Input from Steering Committee and Planning Partnership
Dam Failure	Yes	No	 The 2019 NYS HMP does not identify dam failure as a hazard of concern for New York State, though it is included in the Flood hazard profile. According to the NYS DEC, there are 81 dams within Monroe County, as shown in Section 4. Of these 81 dams in Monroe County: 43 low hazard, 6 intermediate hazard, 9 high hazard, and 23 negligible or no hazard classification code (NYSDEC 2022). 	 NYS DHSES Input from Steering Committee and





Hazard	Is this a hazard that may occur in Monroe County?	If yes, does this hazard pose a significant threat to Monroe County?	• Dam failure is included in the flood profile.	Source(s) Planning
			• Dam failure is included in the flood profile.	PartnershipNYSDECNYS GIS
Pandemic	Yes	Yes	 The 2019 NYS HMP does not identify pandemic as a hazard of concern for New York State. The County has been impacted by various diseases (influenza, COVID-19). The Steering Committee and Planning Partnership has identified pandemic as a hazard of concern for Monroe County. 	 NYS DHSES NYS DEC Input from Steering Committee and Planning Partnership
Drought	Yes	Yes	 The NYS HMP identifies drought as a hazard of concern for the state. Monroe County has been impacted by several drought events that have occurred in New York State. Agriculture is a substantial industry in Monroe County. Drought conditions would severely impact the county's economy. New York State was included in one FEMA drought-related disaster declaration, which did not include Monroe County. Monroe County was included in 3 recent drought-related U.S. Department of Agriculture (USDA) disaster declarations: S4023 - 2016 Drought S4031 - 2016 Drought The Steering Committee and Planning Partnership has identified drought as a hazard of concern for Monroe County. 	 NYS DHSES FEMA USDA Input from Steering Committee and Planning Partnership NOAA-NCEI NRCC





Hazard	Is this a hazard that may occur in Monroe County?	If yes, does this hazard pose a significant threat to Monroe County?	Why was this determination made?	Source(s)
Earthquake	Yes	Yes	 The NYS HMP identified earthquake as a hazard of concern for the state. A 500-year earthquake event could result in a moderate level peak ground acceleration (PGA) of 3.9-5.2%g New York State was included in one FEMA earthquake-related disaster declaration (DR-1415); Monroe County was not included in this declaration. From 2015 to 2022, there have been no significant earthquakes epicentered in Monroe County. Based on input from the Steering Committee and Planning Partnership, earthquake has been identified as a hazard of concern for Monroe County. 	 NYS DHSES Input from Steering Committee and Planning Partnership U.S. Geological Survey (USGS) Earthquake Hazards Program, Review of USGS Seismic Maps
Expansive Soils	Yes	Yes	 The NYS HMP does not identify expansive soils as a hazard of concern for New York State. USGS indicated that Monroe County does not have the type of soils (swelling clay) that would result in expansive or swelling soils; therefore, Monroe County has little to no swelling potential. The Steering Committee and Planning Partnership do not consider the hazard to be a significant concern. 	 NYS DHSES Input from Steering Committee and Planning Partnership Review of USGS 1989 Swelling Clays Map of the Conterminous United States
Extreme Temperature	Yes	Yes	 The NYS HMP identifies Coldwaves and Heatwaves as hazards of concern for New York State. Monroe County was included in six recent USDA disaster declarations related to extreme temperature events: S4023 - 2015 Heat, Excessive Heat S4031 - 2015 Heat Excessive Heat S4037 - 2015 Heat, Excessive Heat S4052 - 2015 Frost, Freeze 	 NYS DHSES Input from Steering Committee and Planning Partnership NOAA-NCEI USDA





Hazard	Is this a hazard that may occur in Monroe County?	If yes, does this hazard pose a significant threat to Monroe County?	Why was this determination made? • S4903 - 2020 Frost, Freeze	Source(s)
			 S4904 - 2020 Frost, Freeze The Steering Committee and Planning Partnership identified extreme temperature as a hazard of concern for Monroe County. 	
Flood (riverine, lakeshore, ice jam, dam failure, urban flooding, and flash flooding)	Yes	Yes	 The NYS HMP identifies flooding as a hazard of concern for New York State. Between 1956 and 2022, Monroe County was included in 4 FEMA flood-related declarations. FEMA DR-338; June 23, 1972; New York Tropical Storm Agnes FEMA DR-367; March 21, 1973; New York High Winds, Wave Action, Flooding FEMA EM-3004; November 2, 1974; New York Flooding FEMA DR-4348; May 2, 2017 - August 6, 2017; New York Flooding Based on the history of flooding and its impacts on Monroe County and input from the Steering Committee and Planning Partnership, flooding has been identified as a hazard of concern for the County. 	 NYS DHSES Input from Steering Committee and Planning Partnership FEMA NOAA-NCEI USACE CRREL Ice Jam Database
Hailstorm	Yes	Yes	Please see Severe Storm Profile	
Hurricane (tropical cyclones, including tropical storms and tropical depressions)	Yes	Yes	Please see Severe Storm Profile	
Ice Jams	Yes	Yes	Please see Flood Profile	
Ice Storm	Yes	Yes	Please see Severe Winter Storm Profile	
Invasive Species/Infestation	Yes	Yes	 The 2019 NYS HMP does not identify invasive species as a hazard of concern for New York State. The Planning Committee considers infestation and invasive species to be a potential hazard to agriculture and recreation in the County. New York State has been affected by various instances of invasive species. The stinkbug infestation of 2010 destroyed over \$46,000 worth of the crops in the County. The county has also experienced infestations from West Nile virus, Armyworm, Emerald ash borers, and Dutch elm disease. Based on input from the Steering Committee and Planning Partnership, invasive species/infestation has been identified as a hazard of concern for Monroe County. 	 NYS DEC Input from Steering Committee and Planning Partnership





Hazard	Is this a hazard that may occur in Monroe County?	If yes, does this hazard pose a significant threat to Monroe County?	Why was this determination made?	Source(s)
Land Subsidence	No	0	 NYS HMP indicates New York State is vulnerable to land subsidence; however, this hazard is "extremely localized" and poses a "very low risk to population and property", according to the 2019 NYS HMP. NYS HMP does not identify Monroe County as a community that has experienced land subsidence in the past. In general, moderate to low land subsidence susceptibility exists for New York State; however, the NYS HMP states that this hazard has a very low risk to population or property. The Steering Committee and Planning Partnership did not identify land subsidence as a hazard of concern for Monroe County. 	 NYS DHSES Input from Steering Committee and Planning Partnership USGS
Landslide	Yes	Yes	 The 2019 NYS HMP includes landslide as a hazard of concern for New York State. Between 1954 and 2022, New York State has included in one landslide-related disaster declaration, which did not include Monroe County. USGS indicates within the National Atlas Map Maker program that Monroe County is identified as having low landslide incidence, with pockets of moderate incidence. Based on previous occurrences and input from the Steering Committee and Planning Partnership, the landslide hazard was identified as a hazard of concern for Monroe County. 	 NYS DHSES Input from Steering Committee and Planning Partnership FEMA
Nor'Easters (extra-tropical cyclones, including severe winter low- pressure systems)	No	No	 Monroe County is located in the western part of New York State and is therefore not highly susceptible to Nor'Easter systems that come up the eastern seaboard. This hazard is briefly mentioned in the "Severe Storms" profile. 	NYS DHSESFEMANOAA-NCEI
Severe Storm (windstorms, thunderstorms, hail, and tornadoes)	Yes	Yes	 The NYS HMP identifies severe storm as a hazard of concern for New York State; however, for the state HMP, the hazards were profiled in individual sections lightning, hail, tornadoes, high winds, and hurricanes/tropical storms. For the Monroe County HMP, the hazards were combined into one profile. Between 1954 and 2022, Monroe County was included in four FEMA severe storm-related declarations. FEMA DR-1244; September 7, 1998; New York Severe Weather FEMA DR-1233; June 25 – July 10, 1998; New York Severe Storms and Flooding FEMA DR-1534; May 13 – June 17, 2004; New York Severe Storms and Flooding FEMA DR-1564; August 13 – September 16, 2004; New York Severe Storms and Flooding Monroe County was included in two recent severe storm-related U.S. Department of Agriculture (USDA) disaster declarations: S3885 - 2015 Excessive Rain, High Winds, Hail, Lightning, and Tornado 	 NYS DHSES FEMA NOAA-NCEI SPC Input from Steering Committee and Planning Partnership



Hazard	Is this a hazard that may occur in Monroe County?	If yes, does this hazard pose a significant threat to Monroe County?	Why was this determination made?	Source(s)
			 S4595 - 2019 Hail Based on previous occurrences and input from the Steering Committee and Planning Partnership, severe storms are identified as a hazard of concern for Monroe County. 	
Severe Winter Storm (heavy snow, blizzards, ice storms)	Yes	Yes	 The NYS HMP identifies ice storms and snowstorms as hazards of concern for New York State. According to the 2019 NYS HMP, Monroe County has an annualized count of 2 snowstorm events and annualized snowstorm losses of \$212 thousand. According to the 2019 NYS HMP, Monroe County has an annualized count of 4 ice storm events and annualized ice storm losses of \$563 thousand. FEMA included Monroe County in 4 snowstorm and 2 ice storm-related disaster declarations: FEMA DR-494; March 19, 1976; New York Ice Storm, Severe Storms; Flooding FEMA DR-898; March 3-4, 1990; New York Severe Storm, Winter Storm FEMA DR-1196; January 5-17, 1998; New York Severe Winter Storms FEMA EM-3138; March 3-6, 1999; New York Winter Storm FEMA DR-1467; April 3-5, 2003; New York Ice Storm Based on previous occurrences and input from the Steering Committee and Planning Partnership, severe winter storms are identified as a hazard of concern for Monroe County. 	 NYS DHSES FEMA NOAA-NCEI Input from Steering Committee and Planning Partnership
Terrorism	Yes	No	 Monroe County has a history of terrorism and has proximity to an international border. The Steering Committee and Planning Partnership do not consider terrorism to be a hazard of concern for Monroe County as is addressed in other preparedness plans. 	 Input from Planning Committee Monroe County OEM
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	 Tsunami is identified as a hazard of concern in the NYS HMP. The Steering Committee and Planning Partnership do not consider tsunami to be a hazard of concern for Monroe County. 	 NYS DHSES Input from Steering Committee and Planning Partnership
Utility Failure	Yes	Yes	• Monroe County experiences utility failures (generally power outages) several times each year. These failures are usually due to severe storms or severe winter storms that affect the county.	NYS DHSESNOAA NCEI





Hazard	i tr o M	is this a hazard hat may occur in Monroe County?	If yes, does this hazard pose a significant threat to Monroe County?	 Why was this determination made? The Steering Committee and Planning Partnership consider utility failure a cascading 	Source(s) Input from
				impact of severe storm, severe winter storm, and flooding events and included discussion of utility failure in those hazard profiles.	Steering Committee and Planning Partnership
Volcano		No	No	• The NYS HMP identifies volcano as a hazard of concern for New York State. However, the Steering Committee and Planning Partnership do not consider volcano to be a hazard of concern for Monroe County.	 NYS DHSES Input from Steering Committee and Planning Partnership
Wildfire		Yes	Yes	 The NYS HMP identifies wildfire as a hazard of concern for New York State. Monroe County was not included in any FEMA wildfire-related disaster declarations. Wildfires have occurred within Monroe County. The county's agriculture industry could be severely impacted by a large wildfire. Based on available data and the nature of the county, the Steering Committee and Planning Partnership identified Wildfire as a hazard of concern. 	 NYS DHSES Input from Steering Committee and Planning Partnership FEMA
Windstorr	n	Yes	Yes	Please see Severe Storm	
CRREL DR EM FEMA NCEI NRCC NYS DEC NYS DHSES NYS HMP PGA SPC USDA USGS	Presidential Presidential Federal Eme National Ce Northeast R New York St New York St	l Disaster L l Disaster E ergency Ma enters for E legional Ch tate Depart tate Divisio tate Hazard d accelerat iction Centa tment of Ag	Declaration Nur Emergency Nur anagement Age nvironmental In imate Center timent of Enviro on of Homeland Mitigation Pla ion er riculture	aber ncy nformation nmental Conservation ' Security and Emergency Services	





5.2.3 Summary of Hazards of Concern

In summary, a total of 11 hazards of concern were identified as significant hazards affecting the entire County, to be addressed at the County level in this plan (shown here in alphabetical order):

- Drought
- Earthquake
- Extreme Temperature
- Flood
- Hazardous Materials
- Infestation and Invasive Species
- Landslide
- Pandemic
- Severe Storm
- Severe Winter Storm
- Wildfire

Other natural and technological hazards of concern have occurred within Monroe County, but have a low potential to occur, are addressed by other planning mechanisms, and/or do not result in significant impacts within the County. Therefore, these hazards will not be further addressed within this version of the Plan. However, if deemed necessary by the County, these hazards may be considered in future versions of the Plan.





5.3 HAZARD RANKING

A comprehensive range of hazards that pose a significant risk to Monroe County were selected and considered during the development of this plan; see Section 5.2 (Identification of Hazards of Concern). However, each community has differing levels of exposure and vulnerability to each of these hazards. It is important for each community participating in this plan to recognize those hazards that pose the greatest risk to their community and direct their attention and resources accordingly to most effectively and efficiently manage risk and reduce losses. The hazard ranking for the County and each participating jurisdiction can be found in their jurisdictional annexes in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

To this end, a hazard risk ranking process was conducted for Monroe County and its municipalities using the method described below. This method includes four risk assessment categories—probability of occurrence, impact (population, property and economy), adaptive capacity, and changing future conditions (i.e., climate change). Each was assigned a weighting factor to calculate an overall ranking value for each hazard of concern. Depending on the calculation, each hazard was assigned a high, medium, or low ranking. Details regarding each of these categories is described below.

5.3.1 Hazard Ranking Methodology

Estimates of hazard risk for the County were developed using methodologies promoted by FEMA's hazard mitigation planning guidance, generated by FEMA's Hazus risk assessment tool, and input from Monroe County and participating jurisdictions.

As described in Section 5.1 (Methodology and Tools), three different levels of analysis were used to estimate potential impacts: 1) historic loss/qualitative analysis; 2) exposure analysis; and 3) loss estimation. All three levels of analysis are suitable for planning purposes; however, with any risk analysis, there is underlying uncertainty resulting from assumptions used to describe and assess vulnerability and the methodologies available to model impacts. Impacts from any hazard event within the County will vary from the analysis presented here based on the factors described for each hazard of concern; namely location, extent, warning time, and mitigation measures in place at the time of an event.

The hazard ranking methodology for some hazards of concern is based on a scenario event, while others are based on their potential risk to the County as a whole. In order to account for these differences, the quantitative hazard ranking methodology was adjusted using professional judgement and subject-matter input; assumptions are included, as appropriate, in the following subsections. The limitations of this analysis are recognized given the scenarios do not have the same likelihood of occurrence; nonetheless, there is value in summarizing and comparing the hazards using a standardized approach to evaluate relative risk. The following categories were considered when evaluating the relative risk of the hazards of concern.

- **Probability of Occurrence** The probability of occurrence of the scenario evaluated was estimated by examining the historic record and/or calculating the likelihood of annual occurrence. When no scenario was assessed, an examination of the historic record and judgement was used to estimate the probability of occurrence of an event that will impact the County.
- **Impact**—The following three hazard impact subcategories were considered: impact to people; impact to buildings; and impact to the economy. The results of the updated risk assessment and/or professional judgement were used to assign the numeric values for these three impact subcategories. A factor was applied to each subcategory, giving impact on population the greatest weight.
 - Population—Numeric value x 3
 - o Buildings—Numeric value x 2





- o Economy—Numeric value x 1
- Adaptive Capacity Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event. This includes capabilities and capacity in the following areas: administrative, technical, planning/regulatory and financial. Mitigation measures already in place increases a jurisdiction's capacity to withstand and rebound from events (e.g. codes/ordinances with higher standards to withstand hazards due to design or location; deployable resources; or plans and procedures in place to respond to an event). In other words, assigning 'weak' for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which increases vulnerability; whereas 'strong' adaptive capacity means the jurisdiction does have the capability to effectively respond, which increases vulnerability. These ratings were assigned using the results of the core capability assessment with subject-matter input from each jurisdiction.
- Climate Change (Changing Future Conditions) Current climate change projections were considered as part of the hazard ranking to ensure the potential for an increase in severity/frequency of the hazard was included. This was important to Monroe County to include because the hazard ranking helps guide and prioritize the mitigation strategy development, which should have a long-term future vision to mitigate the hazards of concern. The potential impacts climate change may have on each hazard of concern is discussed in Sections 5.4.1 through 5.4.11. The benchmark values in the methodology are similar to confidence levels outlined in the National Climate Assessment 2017.

Example Risk Ranking Equation

Risk Ranking = [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.3] + [Capability x 0.3] + [Climate Impact x 0.1] + [Probability of Occurrence x 0.3]

Table 5.3-1 summarizes the categories, benchmark values, and weights used to calculate the risk factor for each hazard. Using the weighting applied, the highest possible risk factor value is 6.9. The higher the number, the greater the relative risk. Based on the total for each hazard, a priority ranking is assigned to each hazard of concern (high, medium, or low). The rankings were categorized as follows: Low = Values less than 3.9; Medium = Values between 3.9 and 4.9; High = Values greater than 4.9.

		Level / Category	Degree of Risk / Benchmark Value	Numeric Value	Weighted Value
		Unlikely	A hazard event is not likely to occur or is unlikely to occur with less than a 1 percent annual chance probability.	0	
Duchability		Rare	Between 1 and 10 percent annual probability of a hazard event occurring.	1	2007
Probability of Occurrence		Between 10 and 100 percent annual probability of a hazard event occurring. Frequent 100 percent annual probability; a hazard event may occur multiple times per year.		2	30%
				3	
		Low	14 percent or less of population is exposed to a hazard with potential for measurable life-safety impact due to its extent and location.		
Turra et	Population (Numeric	Medium	15 to 29 percent of population is exposed to a hazard with potential for measurable life-safety impact due to its extent and location.	2	
(Sum of all 3)	(Sum of	Value x 3) High 30 percent or more of population is exposed potential for measurable life-safety impact, d location.		3	30%
	Property	Low	Property exposure is 14 percent or less of the total number of structures for your community.	1	
(Numeric Value x 2)		Medium	Property exposure is 15 to 29 percent of the total number of structures for the community.	2	





Ca	Le Category Cate		Degree of Risk / Benchmark Value	Numeric Value	Weighted Value
		High	Property exposure is 30 percent or more of the total number of structures for the community.	3	
		Low	Loss estimate is 9 percent or less of the total replacement cost for the community.	1	
	Economy (Numeric Value x 1)	Medium	Loss estimate is 10 to 19 percent of the total replacement cost for the community.	2	
	value x 1)	High	Loss estimate is 20 percent or more of the total replacement cost for the community.	3	
		Weak	Weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.	1	
Adaptive C	Adaptive Capacity		Plans, policies, codes/ordinances in place and meet minimum requirements; mitigation strategies identified but not implemented on a widespread scale; county/jurisdiction can recover but needs outside resources; moderate county/Jurisdiction capabilities.	0	30%
		Strong	Plans, policies, codes/ordinances in place and exceed minimum requirements; mitigation/protective measures in place; county/jurisdiction has ability to recover quickly because resources are readily available, and capabilities are high.	-1	
		Low	No local data are available; modeling projects are uncertain on whether there is increased future risk; confidence level is low (inconclusive evidence).	1	
Climate Ch	Climate Change		Studies and modeling projections indicate a potential for exacerbated conditions due to climate change; confidence level is medium to high (suggestive to moderate evidence).	2	10%
		High	Studies and modeling projections indicate exacerbated conditions/increased future risk due to climate change; very high confidence level (strong evidence, well documented, and acceptable methods).	3	

Note: A numerical value of zero is assigned if there is no impact.

*For the purposes of this exercise, "impacted" means exposed for population and property and estimated loss for economy. For non-natural hazards, although they may occur anywhere in the County, an event will not likely cause countywide impacts; therefore, impact to population was scored using an event-specific scenario.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

5.3.2 Hazard Ranking Results

Using the process described above, the risk ranking for the identified hazards of concern was determined for Monroe County. The hazard ranking for Monroe County is detailed in the subsequent tables that present the stepwise process for the ranking. The countywide risk ranking includes the entire planning area and may not reflect the highest risk indicated for any of the participating jurisdictions. The resulting ranks of each municipality indicate the differing degrees of risk exposure and vulnerability. The results support the appropriate selection and prioritization of initiatives to reduce the highest levels of risk for each municipality. Both the county and the participating jurisdictions have applied the same methodology to develop the countywide risk and local rankings





to ensure consistency in the overall ranking of risk; jurisdictions had the ability to alter rankings based on local knowledge and experience in handling each hazard.

This hazard ranking exercise serves four purposes: (1) to describe the probability of occurrence for each hazard; (2) to describe the impact each would have on the people, property, and economy; (3) to evaluate the capabilities a community has with regards to natural hazards; and (4) to consider changing future conditions (i.e., climate change) in Monroe County. Estimates of risk for Monroe County were developed using methodologies promoted by FEMA's hazard mitigation planning guidance, generated by FEMA's HAZUS-MH risk assessment tool and input from the county and participating municipalities.

Table 5.3-2 shows the probability ranking assigned for the likelihood of occurrence for each hazard.

Hazard of Concern	Probability	Numeric Value
Disease Outbreak	Occasional	2
Drought	Occasional	2
Earthquake	Unlikely	0
Extreme Temperature	Occasional	2
Flood	Occasional	2
Hazardous Materials	Rare	1
Invasive Species	Occasional	2
Landslide	Unlikely	0
Severe Storm	Frequent	3
Severe Winter Storm	Frequent	3
Wildfire	Occasional	2

Table 5.3-2. Probability of Occurrence Ranking for Hazards of Concern for Monroe County

Table 5.3-3 shows the impact evaluation results for each hazard of concern, including impact on property, structures, and the economy on the County level. The weighting factor results and a total impact for each hazard also are summarized. It is noted that several hazards that have a high impact on the local jurisdictional level can have a lower impact when analyzed countywide.

Table 5.3-3. Impact Ranking for Hazards of Concern for Monroe County

	Population				Property			Economy		
Hazard of Concern	Impact	Nume ric Value	Multiplied by Weighing Factor (3)	Impact	Numeric Value	Multiplied by Weighing Factor (2)	Impact	Numeric Value	Multiplied by Weighing Factor (1)	Impact Rating (Population + Property + Economy)
Disease Outbreak	Medium	2	6	Low	1	2	Low	1	1	9
Drought	Medium	2	6	Low	1	2	Medium	2	2	10
Earthquake	Medium	2	6	Medium	2	4	Medium	2	2	12
Extreme Temperature	Medium	2	6	Low	1	2	Medium	2	2	10
Flood	Medium	2	6	High	3	6	Low	1	1	13
Hazardous Materials	Medium	2	6	Low	1	2	Medium	2	2	10
Invasive Species	Low	1	3	Low	1	2	Medium	2	2	7
Landslide	Medium	2	6	Medium	2	4	Medium	2	2	12
Severe Storm	High	3	9	Medium	2	4	Low	1	1	14





		Population			Property			Economy		
Hazard of Concern	Impact	Nume ric Value	Multiplied by Weighing Factor (3)	Impact	Numeric Value	Multiplied by Weighing Factor (2)	Impact	Numeric Value	Multiplied by Weighing Factor (1)	Impact Rating (Population + Property + Economy)
Severe Winter Storm	High	3	9	Medium	2	4	Medium	2	2	15
Wildfire	Low	1	3	Low	1	2	Low	1	1	6

Table 5.3-4 shows the additional impact rankings for the hazards of concern. This includes the overall capabilities of the County and municipalities and the consideration of changing future conditions, such as climate change.

Hazard of Concern	Capabilities	Numeric Value	Climate Change	Numeric Value
Disease Outbreak	Medium	0	Medium	2
Drought	Medium	0	High	3
Earthquake	Medium	0	Low	1
Extreme Temperature	Medium	0	High	3
Flood	Medium	0	High	3
Hazardous Materials	Medium	0	Low	1
Invasive Species	Low	1	High	3
Landslide	Medium	0	Medium	2
Severe Storm	High	-1	High	3
Severe Winter Storm	High	-1	Medium	2
Wildfire	Medium	0	Medium	2

Table 5.3-5 presents the total calculations for each hazard ranking value for the hazards of concern. The rankings were categorized and assigned a color as follows: Low = values less than or equal to 3.8 (green); Medium = values between 3.9 and 4.9 (yellow); High = values greater than or equal to 5.0 (red).

Hazard of Concern	Probability x 30%	Total Impact x 30%	Adaptive Capacity x 30%	Changing Future Conditions x 10%	Total Risk Ranking Value
Disease Outbreak	0.6	2.7	0	0.2	3.5
Drought	0.6	3	0	0.3	3.9
Earthquake	0	3.6	0	0.1	3.7
Extreme Temperature	0.6	3	0	0.3	3.9
Flood	0.9	3.9	0	0.3	5.1
Hazardous Materials	0.3	3	0	0.1	3.4
Invasive Species	0.6	2.1	0.3	0.3	2.7
Landslide	0	3.6	0	0.2	3.8
Severe Storm	0.9	4.2	-0.3	0.3	5.1
Severe Winter Storm	0.9	4.5	-0.3	0.2	5.3
Wildfire	0.6	1.8	0	0.2	2.6

Table 5.3-5. Total Hazard Ranking Values for the Hazards of Concern for Monroe County

Notes: Low = Values less than 3.9; Medium = Values between 3.9 and 4.9; High = Values greater than 4.9





Table 5.3-6 presents the jurisdictional hazard ranking for each hazard. An evaluation of the total risk ranking score determined ranking categories that were grouped into three categories: low, medium, and high. It also includes input by the municipalities.

These rankings have been used as one of the bases for identifying the jurisdictional hazard mitigation strategies included in this plan in Section 9, Jurisdictional Annexes. The summary rankings for the county reflect the results of the vulnerability analysis for each hazard of concern and vary from the specific results of each jurisdiction. For example, the severe storm hazard may be ranked low in one jurisdiction, but due to the exposure and impact countywide, it is ranked as a high hazard and is addressed in the County mitigation strategy accordingly. Jurisdictional ranking results are presented in each ocal annex in this plan in Section 9, Jurisdictional Annexes.





Table 5.3-6. Summary of Overall Ranking of Hazards by Jurisdiction

Monroe County Municipalities	Disease Outbreak	Drought	Earthquake	Extreme Temperature	Flood	Hazardous Material	Invasive Species	Landslide	Severe Storm	Severe Winter Storm	Wildfire
Town of Brighton	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Village of Brockport	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	High
Town of Chili	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Medium
Village of Churchville	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Clarkson	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	High
Town/Village of East Rochester	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Village of Fairport	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Gates	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Town of Greece	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Medium
Town of Hamlin	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Town of Henrietta	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Village of Hilton	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Village of Honeoye Falls	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Irondequoit	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Mendon	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Ogden	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Parma	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Medium
Town of Penfield	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Town of Perinton	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Town of Pittsford	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Village of Pittsford	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Riga	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Medium
City of Rochester	Low	Medium	Low	High	High	Low	Low	Low	High	High	Low
Town of Rush	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Village of Scottsville	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Village of Spencerport	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Sweden	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Webster	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low
Village of Webster	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Town of Wheatland	Low	Medium	Low	Medium	Low	Low	Low	Low	High	High	Low
Monroe County	Low	Medium	Low	Medium	High	Low	Low	Low	High	High	Low





5.4.1 Disease Outbreak

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the disease outbreak hazard in Monroe County.

5.4.1.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections, and the probability of future occurrences for the disease outbreak hazard. For this HMP update, the disease outbreak hazard will primarily focus on disease outbreak events caused by influenza, West Nile Virus, Lyme disease, and coronavirus.

Hazard Description

An outbreak or an epidemic occurs when new cases of a certain disease, in a given population, substantially exceed what is expected. An epidemic may be restricted to one locale, or it may be global, at which point it is called a pandemic. A pandemic is defined as a disease occurring over a wide geographic area and affecting a high proportion of the population. A pandemic can cause sudden, pervasive illness in all age groups on a local or global scale. A pandemic is a novel virus to which humans have no natural immunity that spreads from person to person. A pandemic will cause both widespread and sustained effects and is likely to stress the resources of both the State and Federal government (NJOEM 2019)

Most disease outbreaks occur due to respiratory viruses. A respiratory virus with pandemic potential is a highly contagious respiratory virus that spreads easily from person to person and for which there is little human immunity. This hazard includes pandemic influenza. This hazard strains the healthcare system, requires school closures, causes high rates of illness and absenteeism that undermine critical infrastructure across the city, and decreases community trust due to social distancing measures interfering with personal movement and being perceived as being ineffectual. Previous events that exemplify this hazard include the 1918 ("Spanish flu") and 2009 ("Swine flu") influenza pandemics and the 2003 SARS outbreak, which had pandemic potential (NYC Emergency Management 2019).

In addition to respiratory viruses, diseases with new or emerging features can challenge control. Emerging diseases are difficult to contain or treat and present significant challenges to risk communication since the mechanics of transmission, laboratory identification, and effective treatment protocols may be unknown (NYC Emergency Management 2019).

Of particular concern in Monroe County are respiratory illnesses such as influenza, also known as the 'flu'. While flu symptoms are typically mild, vulnerable populations; older adults, younger children, pregnant persons, and people with pre-existing conditions are more likely to experience flu-related complications. Seasonal flu epidemics occur yearly, typically beginning at the end of October and continuing through the colder months (NYS DOH 2022).

West Nile Virus (WNV) disease is spread by the bite of a mosquito infected with the virus. Mosquitos become infected when they feed on infected birds (NYS DOH 2017). The West Nile Virus cases will increase in portions of the state during the late summer and early fall seasons.

Tick-borne diseases are bacterial illnesses that spread to humans through infected ticks. These types of diseases rely on ticks for transmission. Ticks become infected by micro-organisms when feeding on small, infected mammals (mice and voles). Different tick-borne diseases are caused by different micro-organisms, and it is





possible to be infected with more than one tick-borne disease at a time. Anyone who is bitten by an infected tick may get a tick-borne disease. People who spend a lot of time outdoors have a greater risk of becoming infected. The three types of ticks in New York that may carry disease-causing micro-organisms are the Blacklegged Tick (Ixodes scapularis) (also known as Deer Tick), Lone Star Tick (*Amblyomma americanum*), and the American dog tick (*Dermacentor variabilis*) (New York State Department of Health 2019).

The Novel-Coronavirus, also known as 'Covid-19' is an infection disease caused by the SARS-CoV-2 virus. The virus can spread from an infected person's mouth or nose in small liquid particles through coughing, sneezing, speaking, singing, or breathing (World Health Organization 2022).

For the purposes of this hazard mitigation plan update, the following infectious diseases will be discussed in further detail: Influenza, West Nile Virus (WNV), Lyme Disease, and Coronavirus.

Influenza

Influenza (the flu) is a contagious virus that affects the nose, throat, lungs and other parts of the body. It can quickly spread from one person to another, causing mild to severe illness and can lead to death. Symptoms include fever, cough, sore throat, runny or stuffy nose, muscle or body aches, headache, and tiredness (New York State Department of Health 2021).

The risk of a global influenza pandemic has increased over the last several years. This disease can claim thousands of lives and adversely affect critical infrastructure and key resources. An influenza pandemic can reduce the health, safety, and welfare of the essential services workforce; immobilize core infrastructure, and induce fiscal instability.

Pandemic influenza differs from seasonal influenza (or 'the flu') because outbreaks of seasonal flu are caused by viruses already living amongst people. Pandemic influenza is a global outbreak of a new influenza A virus, which can infect people easily and spread from person to person in an efficient and sustained manner (Center for Disease Control and Prevention 2020). Additionally, the seasonal flu happens annually and usually peaks between December and February.

West Nile Virus

West Nile Virus (WNV) is the leading cause of mosquito-borne disease in the United States. West Nile Virus is most commonly spread to people who are bitten by an infected mosquito. WNV is usually diagnosed during mosquito season, starting in the summer months and continuing through the fall (CDC 2021). WNV was first found in New York State in 1999. Since 2000, 490 human cases and 37 deaths of WNV have been reported statewide (the data range is 2000-2017) (NYS DOH 2017). The symptoms of severe infection (West Nile encephalitis or meningitis) can include headache, high fever, neck stiffness, muscle weakness, stupor, disorientation, tremors, seizures, paralysis, and coma. WNV can cause serious illness, and in some cases, death. Usually, symptoms occur from 3 to 14 days after being bitten by an infected mosquito (NYS DOH 2017).

Lyme Disease

Lyme disease is the most common vector-borne disease in the United States. It is an illness caused by infection with the bacterium *Borrelia burgdorferi*, which is carried by ticks. Typical symptoms include fever, headache, fatigue, and skin rash. If left untreated, symptoms can be severe. Lyme disease is spread to people by the bite of an infected tick (CDC 2021). In New York, the commonly infected tick is the deer tick. Immature ticks become infected by feeding on infected white-footed mice and other small mammals. Deer ticks can also spread other tick-borne diseases. Anyone who is bitten by a tick carrying the bacteria can become infected (NYS DOH 2019).





Coronavirus

Coronavirus disease (COVID-19) is an infectious disease first identified in 2019. The virus rapidly spread into a global pandemic by spring of 2020. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illnesses (World Health Organization 2022). With the virus being relatively new, information regarding transmission and symptoms of the virus is still new. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes.

Reported illnesses have ranged from mild symptoms to severe illness and death. Reported symptoms include difficulty breathing and shortness of breath, fever or chills, cough, fatigue, muscle or body aches, loss of smell or taste, sore throat, congestion, and nausea or vomiting. Emergency symptoms that require immediate medical attention include trouble breathing, persistent pain or pressure in the chest, confusion, or inability to wake or stay awake, and bluish lips or face. Symptoms may appear 2-14 days after exposure to the virus (based on the incubation period of MERS-CoV viruses) (CDC 2021).

As of November 16, 2022, Monroe County has reported 183,834 positive cases of COVID-19 and 1,762 deaths (New York Times 2022).

Extent

The extent and location of disease outbreaks depend on the preferred habitat of the species, as well as the species' ease of movement and establishment. The magnitude of disease outbreaks species ranges from nuisance to widespread. The threat is typically intensified when the ecosystem or host species is already stressed, such as during periods of drought. The already weakened state of the ecosystem causes it to more easily be impacted by an infestation. The presence of diseasecarrying mosquitoes and ticks has been reported throughout most of New York State and Monroe County.

The exact size and extent of an infected population depend on how easily the illness is spread, the mode of transmission, and the amount of contact between infected and uninfected individuals. The transmission rates of pandemic illnesses are often higher in more densely populated areas. The transmission rate of infectious diseases will depend on the mode of transmission of a given illness.

Influenza and Coronavirus

As noted above, the exact size and extent of an infected population depend on how easily the illness is spread, the mode of transmission, and the amount of contact between infected and uninfected individuals. The transmission rates of pandemic illnesses are often higher in more densely populated areas. The transmission rate of infectious diseases will depend on the mode of transmission of a given illness. The severity and length of the next pandemic cannot be predicted; however, experts expect that its effect on the United States could be severe.

Between 2018 and 2021, there were 17,058 confirmed cases of influenza in Monroe County (NYS DOH 2022). Those most vulnerable to influenza include young children and the elderly, although anyone can become infected. In 1999, The World Health Organization (WHO) published guidance for pandemic influenza and defined the six phases of a pandemic. The updated guidance was published in 2005 to redefine these phases, and in 2009 WHO published the *Pandemic Influenza Preparedness and Response*, this guidance significantly updates and replaces the guidance published in 2005 (World Health Organization 2009). The revised guidance retains

the six-phase approach to facilitate the incorporation of new recommendations. Phases 1-3 and 5-6 have been grouped to include common action points. The WHO pandemic phases are outlined in Table 5.4.1 1 below.





Phase	Description						
Preparedness and Response– Global, Regional, National, Sub-National Level							
Phase 1	Phase 1 No animal influenza virus circulating among animals has been reported to cause infection in human						
Phase 2	An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is therefore considered a potential pandemic threat.						
Phase 3 An animal or human-animal influenza reassortant virus has caused sporadic cases or small cluster disease in people but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks.							
Containment							
Phase 4	Human-to-human transmission (H2H) of an animal or human-animal influenza reassortant virus able to sustain community-level outbreaks has been verified.						
Response – Global Level							
Phase 5	The same identified virus has caused sustained community-level outbreaks in two or more countries in one WHO region.						
Phase 6	In addition to the criteria defined in Phase 5, the same virus has caused sustained community-level outbreaks in at least one other country in another WHO region.						
	Post-Pandemic (1997)						
Post-Peak Period	Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.						
Possible New Wave	Level of pandemic influenza activity in most countries with adequate surveillance rising again.						
Post-Pandemic Period	Levels of influenza activity have returned to the levels seen for seasonal influenza in most countries with adequate surveillance						

Table 5.4.1-1. WHO Global Pandemic Phases

Source: WHO 2009

In New York State, activities to be undertaken during the pandemic period, use the World Health Organization's classification system. The Pandemic Influenza Preparedness and Response document provides guidance to government agencies, individuals, families and communities, and the health sectors at the local and global levels.

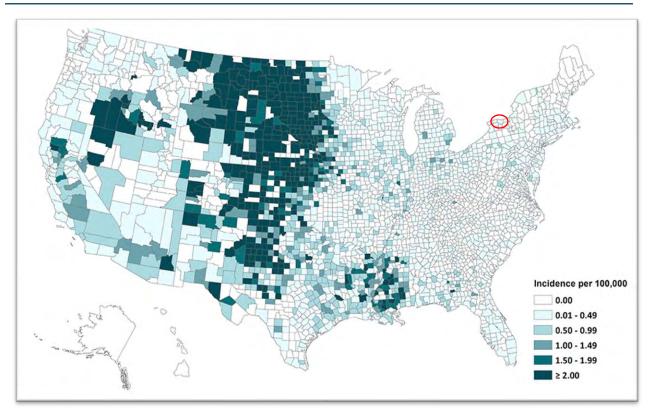
West Nile Virus

West Nile Virus (WNV) is the leading cause of mosquito-borne diseases in the continental United States. There are no vaccines to prevent or medications to treat WNV in people, and those infected rarely experience sickness or symptoms. About 1 in 5 infected people will develop a fever and other symptoms, and 1 in 150 infected people will develop a serious, sometimes fatal, illness (CDC 2022). Figure 5.4.1-1 shows the annual average WNV incidences in the United States. The figure shows that Monroe County had between 0.01 and 0.49 incidents per 100,000 people.





Figure 5.4.1-1. Average Annual Incidence of West Nile Virus Neuroinvasive Disease Reported to CDC by County, 1999-2020



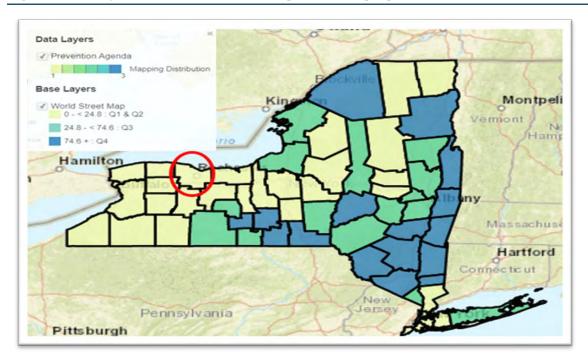
Source:CDC 2022Note:The red circle shows the approximate location of Monroe County

Lyme Disease

Lyme disease is the most reported vector borne illness in the U.S. Between 2000 and 2018, there was a total of 527 confirmed cases in Lyme disease in Monroe County, including 89 cases in 2013, the highest number of reported cases of a given year (TickCheck 2022). The CDC only reports confirmed cases, due to this the true number of cases is estimated at 5,270. Figure 5.4.1-2 below shows New York State and Monroe County related Lyme disease incidents.









 Source:
 Health Data NY

 Note:
 The red circle indicates the approximate location of Monroe County

Location

Monroe County's geographic and demographic characteristics make it particularly vulnerable to importation and spread of infectious diseases. In terms of pandemic influenza, all counties may experience pandemic influenza outbreak caused by factors such as population density and the nature of public meeting areas. Densely populated areas will spread diseases quicker than less densely populated areas. There are some densely populated municipalities in the County, leading to the spread of influenza and coronavirus more quickly than less densely populated communities.

Previous Occurrences and Losses

Historical information regarding previous occurrences and losses associated with disease outbreak events throughout New York State and areas within Monroe County was obtained from many sources. Given so many sources reviewed for the purpose of this HMP, loss and impact information regarding many events could vary depending on the source.

FEMA Major Disaster and Emergency Declarations

New York State has included three disease outbreak-related declarations; one disaster declaration (DR) for Covid-19 and two emergency declarations (EM) for West Nile virus and Covid-19. Generally, these disaster declarations cover a wide range of the State and impact many counties. Monroe County was included in each of these Statewide disaster declarations.





Table 5.4.1-2. FEMA DR and EM Declarations for Disease Outbreak Events in Monroe County, 2000 to2020

FEMA Declaration Number	Date(s) Of Event	Event Type	Details
EM-3155	May 22, 2000 – November 1, 2000	Other	West Nile Virus
DR-4480	January 20, 2020 – Ongoing	Biological	COVID-19 Pandemic
EM-3434	January 20, 2020 – Ongoing	Biological	COVID-19 Pandemic

Source: FEMA 2022

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was not included in any USDA-designated agricultural disasters that included disease outbreak events.

Previous Events

Table 5.4.1-3 identifies the known flood events that impacted Monroe County between 2015 and 2022. For events before 2015, refer to Appendix H (Risk Assessment Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.1-3. Major Disease Outbreak Events in Monroe County, 2015 to 2022

Dates of Event	Disease Type	FEMA Declaration Number (if applicable)	Monroe County Designated?	Description
2015	Influenza	N/A	N/A	2,616 confirmed cases of influenza in Monroe County
2015	Lyme Disease	N/A	N/A	123 confirmed cases of Lyme disease in Monroe County
2015	West Nile Virus	N/A	N/A	One confirmed case of West Nile Virus in Monroe County
2016	Influenza	N/A	N/A	2,824 confirmed cases of influenza in Monroe County
2016	Lyme Disease	N/A	N/A	109 confirmed cases of Lyme disease in Monroe County
2016	West Nile Virus	N/A	N/A	One confirmed case of West Nile Virus in Monroe County
2017	Influenza	N/A	N/A	3,701 confirmed cases of influenza in Monroe County
2017	Lyme Disease	N/A	N/A	184 confirmed cases of Lyme disease in Monroe County
2018	Influenza	N/A	N/A	6,902 confirmed cases of influenza in Monroe County
2018	Lyme Disease	N/A	N/A	101 confirmed cases of Lyme disease in Monroe County
2018	West Nile Virus	N/A	N/A	Five confirmed cases of West Nile Virus in Monroe County
2020- 2021	Coronavirus	DR-4480, EM-3434	Yes	Monroe County received Public Assistance: Emergency protective measures (Category B). As of November 16, 2022, Monroe County has reported 183,834 positive cases of COVID-19 and 1,762 deaths.

Source: FEMA 2022; NYSDOH 2021; USA Facts 2022

Note: 2019 to present reports were not available for influenza, Lyme disease, and West Nile Virus.





Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to increase. The impacts related to increasing temperatures and sea level rise are already causing complications in the state. *ClimAID: The Integrated Assessment for Effective Climate Change in New York State (ClimAID)* was undertaken to provide decision-makers with information on the state's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2011/2014).

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2–3.4 °F by the 2020s, 4.1–6.8 °F by the 2050s, and 5.3–10.1 °F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the state (NYSERDA 2011/2014).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1 (Western New York and the Great Lake Plains), where temperatures are estimated to increase by 4.3 to 6.3°F by the 2050s and 5.7 to 9.6°F by the 2080s (baseline of 47.7°F, middle range projection). Precipitation totals are estimated to increase between four to ten percent by the 2050s and four to thirteen percent by the 2080s (baseline of 34.0 inches, middle-range projection). Table 5.4.1-4. 4 displays the projected seasonal precipitation change for the region (NYSERDA 2011/2014).

Table 5.4.1-4. Projected Seasonal Precipitation Change in Region 2, 2050s (% change)

	Winter	Spring	Summer	Fall
	+5 to +15	0 to +15	-10 to +10	-5 to +10
Source:	NYSERDA 2014			

Warmer temperatures and changing rainfall patterns provide an environment where mosquitos can remain active longer, greatly increasing the risk for animals and humans. Lyme disease could also expand throughout the United States as temperatures warm, allowing ticks to move into new areas of the country. The climate changes can also allow tropical and subtropical insects to move from regions where diseases thrive into new places (Natural Resource Defense Council 2015).

An increase in temperature and humidity may also lead to a larger number of influenza outbreaks. Studies have shown that warmer winters led to an increase in influenza cases. During warm winters, fewer people contract influenza which causes a large number in population to remain vulnerable into the next season. This causes an early and strong occurrence of the virus (Towers, et al. 2013).

Probability of Future Occurrences

It is difficult to predict when the next disease outbreak will occur and how severe it will be because viruses are always changing. The United States and other countries are constantly preparing to respond to pandemics. The Department of Health and Human Services and others are developing supplies of vaccines and medicines. In addition, the United States has been working with the WHO and other countries to strengthen the detection of disease and response to outbreaks. Preparedness efforts are ongoing via the New York State Department of Health, and local health departments through community preparedness programs to empower local health departments and their community partners to promote local readiness, foster community resilience, and to ensure comprehensive, coordinated, and effective responses





In Monroe County, the probability for a future disease outbreak event is dependent on several factors. One factor that influences the spread of disease is population density. Populations that live close to one another are more likely to spread diseases. As population density increases in the County, so too will the probability of a disease outbreak event to occur. When there is a significant change in a circulating strain of a virus, more of the population is susceptible and the strain could rapidly spread from person to person (NYC Emergency Management 2019).

As for mosquito-borne and tick-borne diseases, as long as mosquitoes and ticks are found in Monroe County, the risk of contracting WNV, Lyme disease, or other diseases carried by these insects exists. Instances of WNV have been generally decreasing throughout the northeast United States due to planning and eradication efforts. However, some scientists anticipate an increase in WNV and other mosquito-borne diseases due to changing climate conditions creating suitable habitats for mosquitoes (CDC 2013). Disease-carrying ticks will continue to inhabit Monroe County and the threat of Lyme disease and other tick-borne diseases will continue. Similar to mosquitoes, there are eradication efforts in place to control the tick population and new methods of control are being developed (Steere, Coburn and Glickstein 2004). Therefore, based on all available information and available data regarding mosquito and tick populations, it is anticipated that mosquito- and tick-borne diseases will continue to be a threat to Monroe County.

Based on historical records and input from the Steering Committee, the probability of occurrence for disease outbreak events in the County is considered "occasional" (between 10 and 100 percent annual probability of a hazard event occurring as presented in Table 5.3-2). Disease outbreak was not previously ranked as a hazard of concern for the County. With the emergence of the COVID-19 pandemic, disease outbreak has been identified as a new hazard of concern for many counties throughout the State.

5.4.1.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable to the identified hazard. The following discusses Monroe County's vulnerability, in a qualitative nature, to the disease outbreak hazard.

Impact on Life, Health, and Safety

The entire population of Monroe County (753,109) is vulnerable to the disease outbreak hazard. Due to a lack of quantifiable loss information, a qualitative assessment was conducted to evaluate the assets exposed to this hazard and the potential impacts associated with this hazard. Healthcare providers and first responders have an increased risk of exposure due to their frequent contact with infected populations. Areas with a higher population density also have an increased risk of exposure or transmission of disease to the closer proximity of the population to potentially infected people.

Most recently with COVID-19, the Centers for Disease Control and Prevention have indicated that persons over 65 years and older, persons living in a nursing home or long-term care facility, and persons with underlying medical conditions such as diabetes, severe obesity, serious heart conditions, etc. are at a higher risk of getting severely ill (CDC 2021). According to the 2020 American Community Survey 5-year Estimates, there are 128,588 persons over 65 years old in Monroe County (16.9 percent of the County population). This age group would be considered at risk for getting severely ill from the COVID-19 virus.

Impact on General Building Stock

No structures are anticipated to be directly affected by disease outbreaks.





Impact on Critical Facilities

No critical facilities are anticipated to be affected by disease outbreaks. Hospitals and medical facilities will likely see an increase in patients which may cause an interruption of services, but it is unlikely that there will be damage to the facilities. Large rates of infection may increase the rate of hospitalization which may overwhelm hospitals and medical facilities and lead to decreased services for those seeking medical attention. The recent coronavirus pandemic has led to overwhelmed hospitals in numerous locations across New York State, including Monroe County.

Impact on Economy

The impact disease outbreaks have on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with the activities and programs implemented to conduct surveillance and address disease outbreaks have not been quantified in the available documentation. Instead, activities and programs implemented by the County to address this hazard are described below, all of which could impact the local economy.

COVID-19 has had a significant impact on employment levels in the Finger Lakes Region. At its peak decline in April, the Rochester Metropolitan Statistical Area (RMSA) had 101,500 fewer non-farm jobs than a year earlier, including nearly 87,000 in the private sector. May through July brought partial recovery, with the July year-over-year decline totaling 69,500 overall jobs (including 59,400 in the private sector) (Finger Lakes Regional Economic Development Council 2020). Tourism, hospitality, and retail trade sectors accounted for nearly a third of job losses as of July 2020.

Smaller-scale disease outbreaks can also cause negative economic impacts, though the extent of the impact is variable. For example, an outbreak of mosquito or tick-borne diseases can impact Monroe County's local economies associated with tourism and the use of parks and waterbodies

Impact on the Environment

Disease outbreaks may have an impact on the environment if the outbreaks are caused by invasive species. Invasive species tend to be competitive with native species and their habitat and can be the major transmitters of disease like Zika, dengue, and yellow fever (Placer Mosquito and Vector Control District 2019). Secondary impacts from mitigating disease outbreaks could also have an impact on the environment. Pesticides used to control disease carrying insects like mosquitos have been reviewed by the EPA and the New York Department of Environmental Conservation. If these sprays are applied in large concentrations, they could potentially leach into waterways and harm nearby terrestrial species. As a result, pesticides must be registered before they can be sold, distributed, or used in the state (New York Department of Environmental Conservation 2020).

Cascading Impacts on Other Hazards

There are no known cascading impacts that disease outbreaks can cause to other hazards of concern for Monroe County.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

• Potential or projected development





- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

As discussed in Section 4 (County Profile), areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by the disease outbreak hazard because the entire planning area is exposed and vulnerable. Additional development of structures in areas with high population density are at an increased risk. Please refer to the specific areas of development indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of population could influence the number of persons exposed to disease outbreaks. Higher density jurisdictions are not only at risk of greater exposure to disease outbreak, density may also reduce available basic services provided by critical facilities such as hospitals and emergency facilities for persons that are not affected by a disease. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

As discussed earlier in this section, the relationship between climate change and increase in infectious diseases is difficult to predict with certainty, however there may be linkages between the two. Changes in the environment may create a more livable habitat for vectors carrying disease as suggested by the Centers for Disease Control and Prevention (CDC 2021). Localized changes in climate and human interaction may also be a factor in the spread of disease.

Change of Vulnerability Since 2017 HMP

Disease outbreak was not identified as a hazard of concern in the 2017 HMP. Tick-borne diseases including Lyme and West Nile Virus as well as coronavirus are included in this section. Updated data regarding the extent of these diseases are included to provide a better understanding of the potential impacts caused by the disease outbreak hazard.





5.4.2 DROUGHT

This section provides a profile and vulnerability assessment of the drought hazard for Monroe County.

5.4.2.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections, and the probability of future occurrences of the drought hazard.

Hazard Description

Drought is a period characterized by long durations of below-normal precipitation. Drought is a temporary irregularity and differs from aridity since the latter is restricted to low-rainfall regions and is a permanent feature of climate. Drought conditions occur in virtually all climatic zones, yet its characteristics vary significantly from one region to another, since it is relative to the normal precipitation in that region. Drought can affect agriculture, water supply, aquatic ecology, wildlife, and plant life.

There are four different ways that drought can be defined or grouped:

- *Meteorological* drought is a measure of the departure of precipitation from normal. It is defined solely by the relative degree of dryness. Due to climatic differences, what might be considered a drought in one location of the country may not be a drought in another location.
- *Agricultural* drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels, and other parameters. It occurs when there is not enough water available for a particular crop to grow at a particular time. Agricultural drought is defined in terms of soil moisture deficiencies relative to water demands of plant life, primarily crops.
- *Hydrological* drought is associated with the effects of periods of precipitation shortfalls (including snowfall) on surface or subsurface water supply. It occurs when these water supplies are below normal. It is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- **Socioeconomic** drought is associated with the supply and demand of an economic good with elements of meteorological, hydrological, and agricultural drought. This differs from the aforementioned types of drought because its occurrence depends on the time and space processes of supply and demand to identify or classify droughts. The supply of many economic goods depends on the weather (for example water, forage, food grains, fish, and hydroelectric power). Socioeconomic drought occurs when the demand for an economic good exceeds the supply as a result of a weather-related shortfall in the water supply (NDMC 2013).

Location

New York State is divided into nine drought management regions based roughly on drainage basins and county lines. NYSDEC monitors precipitation, lake and reservoir levels, stream flow, and groundwater levels every month within each region, and more frequently during periods of drought. NYSDEC uses these data to assess the condition within each region, which can range from "normal" to "drought disaster" (NYSDEC 2022). Monroe County is identified as NYSDEC Drought Management Region 6, the Great Lakes Drought Region (Figure 5.4.2-1).









Note: The red circle indicates the approximate location of Monroe County.

When a drought occurs, the agricultural industry is most at risk in terms of economic impact and damage. According to the 2017 Census of Agriculture, Monroe County is home to 527 farms, covering 106,778 acres. Only 1 percent of that land is irrigated (USDA 2017). Some farms have access to Monroe County Water Authority for tank loads during emergencies. Many dairy operations on the west side of Monroe County are on well water, while many horse operations in the County are on public water service. In cases of emergency, tank loads can be dumped into wells or on-site water tanks can be delivered. A minority of crop farmers in Monroe County have irrigation and access to an emergency water source.

Extent

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts (NOAA 2022). The NYSDEC and the New York State Drought Management Task Force identify droughts in the following four stages:

- Normal is considered the standard moisture soil levels found throughout New York State
- **Drought Watch** is the first stage of drought. This stage is declared by the NYSDEC and is intended to give advance notice of a developing drought. At this stage, the general public is urged to conserve water. Public water purveyors and industries are urged to update and begin to implement individual drought contingency plans.





- **Drought Warning** is the second stage of drought. This stage is also declared by the NYSDEC and is a notice of impending and imminent severe drought conditions. A warning declaration includes stepping up public awareness and increasing voluntary conservation. Public water supply purveyors and industries are urged to continue to implement local drought contingency plans. Federal, state, and local water resources agencies are notified to prepare for emergency response measures.
- **Drought Emergency** is the third stage of drought. This stage is declared by the NYSDHSES, based upon the recommendation of the Task Force. It is a notice of existing severe and persistent drought conditions. An emergency declaration is a notice for local water resources agencies to mandate conservation and implement other emergency response measures. A continuing and worsening drought emergency may result in the New York State governor declaring a drought disaster. It is a notice of the most severe and persistent drought conditions. At this stage, a significant proportion of communities in the impacted area likely are unable to respond adequately (NYSDEC n.d.).

New York State applies two methodologies to identify the different drought stages. The most commonly used indicator is the Palmer Drought Severity Index (PDSI), which is primarily based on soil conditions. Soil with decreased moisture content is the first indicator of an overall moisture deficit. The second methodology applied in New York State, created by the NYSDEC, is known as the State Drought Index (SDI) (NYSDEC n.d.).

Table 5.4.2-1 lists the Palmer Drought Severity Index (PDSI) classifications. According to the National Integrated Drought Information System (NIDIS), the PDSI was developed in 1965, and indicates prolonged and abnormal moisture deficiency or excess. It uses temperature and precipitation data to calculate water supply and demand, incorporates soil moisture, and is considered most effective for assessing moisture conditions in unirrigated cropland. The PDSI primarily indicates long-term drought and has been used extensively as a signal to initiate drought relief (NIDIS 2015).

Palmer Classifications		
4.0 or more	Extremely wet	
3.0 to 3.99	Very wet	
2.0 to 2.99	Moderately wet	
1.0 to 1.99	Slightly wet	
0.5 to 0.99	Incipient wet spell	
0.49 to -0.49	Near normal	
-0.5 to -0.99	Incipient dry spell	
-1.0 to -1.99	Mild drought	
-2.0 to -2.99	Moderate drought	
-3.0 to -3.99	Severe drought	
-4.0 or less	Extreme drought	

Table 5.4.2-1. PDSI Classifications

Source: NDMC 2013

The SDI evaluates drought conditions more comprehensively by determining whether numerous indicators reach dire thresholds. It compares the following four parameters to historical or "normal" values to evaluate drought conditions: stream flows, precipitation, lake and reservoir storage levels, and groundwater levels. The State's Drought Management Task Force uses those factors along with water use, duration of the dry period, and season to assess drought within different areas of the State. The data acquired are compared to critical threshold values to indicate a normal or changeable drought condition. The indicators are weighted regionally to reflect the different circumstances within each drought management region (NYS DHSES 2014; NYSDEC 2022). Table 5.4.2-2 lists the SDI index range within the Normal stage and the three drought stages.





Table 5.4.2-2. State Drought Index Range of Values

Drought Stage	Drought Index Range
Normal	100 to 150
Watch	75 to 100
Warning	50 to 70
Emergency	0 to 50

Source: NYS DHSES 2014

Previous Occurrences and Losses

Many sources provide historical information regarding previous occurrences and losses associated with drought events throughout New York State and Monroe County. Information about loss and impact resulting from each of many events can vary depending on the source. Notably, monetary amounts cited in this section on drought derive solely from information obtained during the research for this HMP.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, FEMA declared that New York State underwent one drought-related disaster (DR) or emergency (EM) classified as a water shortage. Generally, drought-related disasters affect a wide region of the State and thus may have impacted many counties. However, Monroe County was not included in the disaster declaration.

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that included or may have included losses due to drought:

- S4023 2016 Drought
- S4031 2016 Drought
- S4037 2016 Drought

The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are low the following years as well. USDA records indicate that Monroe County has experienced crop losses from severe storm events in the years when USDA disasters were declared. Table 5.4.2-3 provides details regarding crop losses in Monroe County according to USDA records.

Year	Сгор Туре	Cause of Loss	Losses
2016	Wheat	Drought	\$2,697.00
2016	Corn	Drought	\$1,183,280.10
2016	Sweet Corn	Drought	\$134,788.80
2016	Fresh Market Sweet Corn	Drought	\$49,309.00
2016	Processing Beans	Drought	\$84,969.50
2016	Dry Beans	Drought	\$73,666.00
2016	Apples	Drought	\$30,050.22

Table 5.4.2-3. USDA Crop Losses from Drought in Monroe County





Year	Сгор Туре	Cause of Loss	Losses				
2016	Green Peas	Drought	\$89,502.00				
2016	Cabbage	Drought	\$80,389.00				
2016	Soybeans	Drought	\$367,032.80				
Source: USDA 20	Source: USDA 2022						

Previous Events

Table 5.4.2-4 identifies the known drought events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.2-4. Drought Events in Monroe County between 2015 and 2022.

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
January – July 2015	Drought	N/A	No	According to the U.S. Drought Monitor, D0 conditions in Monroe County lasted from January through July 2015.
December 2015 – February 2016	Drought	N/A	No	According to the U.S. Drought Monitor, D0 conditions lasted from December 2015 to February 2016.
May 2016 – March 2017	Drought	N/A	No	According to the U.S. Drought Monitor, conditions varied between D0 – D3 drought in Monroe County from summer 2016 to the spring of 2017. NOAA – NCEI described a weather pattern supporting dry conditions were prevalent across New York resulting in below-normal precipitation. In addition, below-normal snowpack from a mild winter left conditions drier than normal going into spring. These were the primary factors that led to the drought conditions. The USGS groundwater level network showed that numerous wells are in the driest 10th percentile.
June – September 2018	Drought	N/A	No	According to the U.S. Drought Monitor, conditions varied from D0-D1 drought conditions in Monroe County from June to September 2018.
September – October 2019	Drought	N/A	No	Monroe County briefly experienced D0 drought conditions from September to October 2019 according to the U.S. Drought Monitor.
July 2022	Drought Watch	N/A	No	Monroe County is one of 21 counties placed under drought watch by the New York State Department of Environmental Conservation.

Sources: NOAA-NCEI 2022; USDA 2022; U.S. Drought Monitor 2022; (Rochester First 2022); The Democrat and Chronicle Various Articles; NWS Buffalo 2007; The Times Union 2007.

Federal Emergency Management Agency FEMA

Not applicable

N/A NRCC Northeast Regional Climate Center

NWS National Weather Service

USDA U.S. Department of Agriculture





Climate Change Impacts

According to the 2019 New York State HMP update, rising summer temperatures, along with little change in summer rainfall, are projected to increase frequency of short-term droughts. This scenario will lead to impacts on the natural and managed ecosystems across New York State. Water management and hydrology are also affected (NYS DHSES 2019).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1, Western New York, Great Lakes Plain. In Region 1, it is estimated that temperatures will increase by 3.0 °F to 5.5 °F by the 2050s and 4.5 °F to 8.5 °F by the 2080s (baseline of 48.0 °F, mid-range projection). Precipitation totals will increase between 0 and 10 percent by the 2050s and 0 to 15 percent by the 2080s (baseline of 37.0 inches, mid-range projection). Table 5.4.2-5 displays the projected seasonal precipitation change for the Region 1 (NYSERDA 2011).

Table 5.4.2-5. Projected Seasonal Precipitation Change in Region 1, 2050s (% change)

	Winter	Spring	Summer	Fall
	5 to +15	0 to +15	-10 to +10	-5 to +10
Source	NVSEDDA 2011			

Source: NYSERDA 2011

With the increase in temperatures, heat waves will become more frequent and intense as shown in Table 5.4.2-6 below. Heat waves, defined as three or more consecutive days with maximum temperatures at or above 90 °F. Summer droughts are projected to increase under these conditions, affecting water supply, agriculture, ecosystems, and energy projects (NYSERDA 2014).

Middle Range (25th to 75th Percentile)	2020s	2050s	2080's
Days over 90 °F (8 days)	14 to 17	22 to 34	27 to 57
# of Heat Waves (0.7 heat waves)	2 to 2	3 to 4	3 to 8
Duration of Heat Waves (4 days)	4 to 4	4 to 5	5 to 6
Days below 32 °F (133 days)	103 to 111	84 to 96	68 to 88
Days over 1" Rainfall (5 days)	5 to 5	5 to 5	5 to 6
Days over 2" Rainfall (0.6 days)	0.6 to 0.7	0.6 to 0.8	0.6 to 0.9

Table 5.4.2-6. Extreme Event Projections for Region 1

Source: NYSERDA 2014

By the end of the 21st century, the number of droughts is likely to increase, as the effect of higher temperatures on evaporation is likely to outweigh the increase in precipitation. Droughts in the northeast U.S. have been associated with local and remote modes of multi-year ocean-atmosphere variability that are unpredictable and may change with climate change. Changes in distribution of precipitation throughout the year and in timing of snowmelt could increase frequency of droughts (NYSERDA 2011).

Probability of Future Occurrences

Based upon risk factors for and past occurrences, it is likely that droughts will occur across New York State and Monroe County in the future. In addition, as temperatures increase (see climate change impacts), the probability





for future droughts will likely increase as well. Therefore, it is likely that droughts will occur in the State and County of varied severity in the future.

It is estimated that Monroe County will continue to experience direct and indirect impacts of drought and its impacts on occasion, with the secondary effects causing potential disruption or damage to agricultural activities and creating shortages in water supply within communities.

In Section 5.3, the identified hazards of concern for Monroe County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, the probability of occurrence for drought in the County is considered 'occasional' (between 10 and 100 percent annual probability of a hazard event occurring, as presented in Table 5.3-2).

5.4.2.2 Vulnerability Assessment

Drought is a significant concern to Monroe County, mainly due to its impact on public health, natural resources, and agriculture. Estimated losses are difficult to quantify; however, drought events can impact Monroe County's population and economy. Assets at particular risk would include areas used for agricultural purposes (farms and cropland). In the past, drought in other counties and regions affected Monroe County, including the 2007 persistent shortage of rainfall along the Mohawk Valley and in Western New York. This dry period reduced the amount of water available to maintain sufficient navigational depth in some sections of the NYS Canal System, which was forced to close commercial traffic one week early that October, impacting local food supply and trade markets. That closure also impacted water-based recreational markets, affecting the local economy. Year-round recreation and tourism in Monroe County from snow skiing to boating and other activities rely on water.

In addition, water supply resources could be impacted by extended periods of below average rain. The County's public water supply is lake fed, but rural populations are served by private wells and are significantly affected by periods of diminished groundwater resources. Particularly susceptible to the drought hazard and cascading impacts are populations vulnerable because of age, health conditions, limited ability to mobilize to shelter, and limited accessibility to cooling and medical resources.

Potential drought impacts are agricultural, hydrologic, and socioeconomic. The sequence of these impacts highlights the differences among them. When a drought begins, the agricultural sector is typically the first to be affected due to its heavy dependence on stored soil water. During dry periods, soil water can deplete quickly. If precipitation deficiencies continue, people who depend on other sources of water will begin to feel impacts of the shortage. Those who rely on surface water (for example, reservoirs and lakes) and subsurface water (for example, groundwater) are usually the last to be affected. A short-term drought that persists for 3 to 6 months may have little impact on these sectors, depending on characteristics of the hydrologic system and intensity of water use (NYS DHSES 2014).

Because agriculture and related sectors, including forestry, fisheries, and water activities, rely on surface and subsurface water supplies, they are vulnerable to numerous economic impacts. Droughts often result in loss of crop yields and livestock production, increased issues with insect infestations, increased forest diseases, and reduced growth. Forest and grass fires also increase substantially during extended drought periods, posing higher levels of risk to human and wildlife populations, as well as to property (NYS DHSES 2014)

Loss of income is another factor in assessment of impacts of drought. Examples of income loss include reduced income for farmers, and for retailers and others who provide goods and services to farmers. The recreation and tourism industries may also undergo a loss of income because of increased costs of food, energy, and other products as supplies decrease. Some local shortages of certain goods trigger the need to import goods from





outside the affected region. Reduced water supply affects use of rivers and other water bodies. Hydropower production may also be impacted by drought (NYS DHSES 2014)

Environmental losses from drought include damages to plant and animal species, wildfire habitat, and air and water quality; forest and grass fires; degradation of landscape quality; loss of biodiversity; and soil erosion. Some impacts may be short-term, and others may linger for longer periods of time. If changes in climate intensify, environmental impacts and losses may become more significant. Wildfire habitat may be degraded through loss of wetlands, lakes, and vegetation. Increased soil erosion can lead to a more permanent loss of biological productivity of landscapes. However, quantifying environmental losses is difficult (NYS DHSES 2014).

Social impacts primarily involve public safety, health, conflicts among water users, reduced quality of life, and inequities in distribution of impacts and disaster relief. Many economic and environmental effects induce social impacts as well (NYS DHSES 2014).

To understand risk, a community must evaluate what assets are exposed or vulnerable within the identified hazard area. Regarding the drought hazard, all of Monroe County has been identified as the hazard area. Therefore, all assets within the County (population, structures, critical facilities, and lifelines), as described in the County Profile (Section 4), are vulnerable to a drought. The following factors are addressed in subsequent text that evaluates and estimates potential impacts of the drought hazard on the County:

- Impact on: (1) life, health, and safety of residents; (2) general building stock; (3) critical facilities; (4) economy; and (5) environment
- Cascading Impacts on Other Hazards
- Future changes that may impact vulnerability
- Change of vulnerability since the 2017 HMP

Impact on Life, Health, and Safety

The entire population of Monroe County is vulnerable to drought events. According to the 2020 U.S. Census, the county had a population of 753,109. Drought conditions can affect people's health and safety, including health problems related to low water flows and poor water quality, and health problems related to dust. Droughts also can lead to loss of human life (NDMC 2013). Other possible impacts on health from drought include increased recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and sanitation and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Health implications of drought are numerous. Some drought-related health effects are short-term while others can be long-term (CDC 2012).

As previously stated, drought conditions can cause shortages of water for human consumption. Droughts can also lead to reduced local firefighting capabilities. The drought hazard is a concern for Monroe County because rural populations within the County rely upon private water supply from local groundwater resources.

Impact on General Building Stock

A drought event is not expected to directly affect any structures. However, droughts contribute to conditions conducive to wildfires and reduce fire-fighting capabilities. Risk to life and property is greatest within those areas where forested areas adjoin urbanized areas (high-density residential, commercial, and industrial) or wildland urban interface (WUI). Therefore, all assets within and adjacent to the WUI zone—including population, structures, critical facilities, lifelines, and businesses—are considered vulnerable to wildfire. Refer to Section 5.4.11 for more information on wildfire risk.





Impact on Critical Facilities

Water supply facilities may be affected by short supplies of water. As mentioned, drought events generally do not impact buildings; however, droughts can impact agriculture-related facilities and critical facilities associated with potable water supplies. Also, those critical facilities in and adjacent to the WUI zone are considered vulnerable to wildfire. Refer to Section 5.4.11 for more information on wildfire risk.

Impact on Economy

Drought causes many economic impacts on agriculture and related sectors (forestry, fisheries, and waterborne activities). In addition to losses in yields in crop and livestock production, drought is associated with increased insect infestations, plant diseases, and wind erosion. Drought can lead to other losses because so many sectors are affected—losses that include reduced income for farmers and reduced business for retailers and others who provide goods and services to farmers. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue. Prices for food, energy, and other products may also increase as supplies decrease (NYS DHSES 2014). As noted in the 2019 New York State HMP, economic impacts that could occur from drought include the following:

- Decreased land prices
- Loss to industries directly dependent on agricultural production (e.g., machinery and
- Fertilizer manufacturers, food processors, dairies, etc.)
- Unemployment from drought-related declines in production
- Strain on financial institutions (foreclosures, more credit risk, capital shortfalls)
- Revenue losses to Federal, State, and Local governments (from reduced tax base)
- Reduction of economic development
- Fewer agricultural producers (due to bankruptcies, new occupations)
- Rural population loss.

When a drought occurs, the agricultural industry is most at risk for economic impact and damage. During droughts, crops do not mature, which results in smaller crop yield, undernourishment of wildlife and livestock, decreases in land values, and ultimately financial loss to the farmer (FEMA 1997).

Based on the 2017 Census of Agriculture, 527 farms were present in Monroe County, encompassing 106,778 acres of total farmland. The average farm size was 203 acres. Monroe County farms had a total market value of products sold of \$76.64 million, averaging \$145,433 per farm (USDA 2017). Table 5.4.2-7 lists the acreage of agricultural land exposed to the drought hazard.

Table 5.4.2-7. Agricultural Land in Monroe County in 2017

Number of Farms	Land in Farms (acres)	Total Cropland (acres)	Total Pastureland (acres)	Acres Irrigated
527	106,778	85,422	4,271	639

Source: USDA 2017

In 2017, the top three agricultural products sold in Monroe County were grains, oilseeds, dry beans, and dry peas at \$26 million; vegetables, melons, potatoes, and sweet potatoes at \$19.7 million; and nursery, greenhouse, floriculture, and sod at \$11.9 million. Monroe County was the eighth-highest-ranked County in the State for its sales of cut Christmas trees and short rotation woody crops, and sixth highest ranked for its total acreage of crop items for all harvested vegetables (USDA 2017).





If the average production (dollar value) per crop type could be identified on a per acre basis, loss estimates could be developed based on assumed percent damage that could result from a drought. If a drought impacted 40 percent of the agricultural products sold from Monroe County farms, based on 2017 market values, this would be a loss of \$30.6 million. This figure does not include how the tourism industry and local jobs are impacted.

Impact on the Environment

Drought can impact the environment because it can trigger wildfires, increase insect infestations, and exacerbate the spread of disease (NOAA 2000). Droughts will also impact water resources that are relied upon by aquatic and terrestrial species. Ecologically sensitive areas, such as wetlands, can be particularly vulnerable to drought periods because they are dependent on steady water levels and soil moisture availability to sustain growth. As a result, these types of habitats can be negatively impacted after long periods of dryness.

Cascading Impacts On Other Hazards

Drought may trigger wildfires in the County. As discussed in earlier sections, drought can lead to increasing temperatures and evaporation of moisture, which are ideal dry conditions for wildfire events to occur. Dry, hot, and windy weather combined with dry vegetation is more susceptible to sparking wildfires when met with a spark created by humans or natural events, such as lightning (National Integrated Drought Information System 2020). Refer to Section 5.4.11 for more information on wildfire risk.

Drought may also increase the spread of certain insect infestations. For more information on invasive species, refer to Section 5.4.7.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in the population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Section 4 identifies areas targeted for future growth and development across the County. Any areas of growth located in the County could be susceptible to drought. Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in the Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of the population can impact the number of persons exposed to drought and the draw upon water resources.

Climate Change

As discussed above, most studies project that the State of New York and Monroe County will see an increase in average annual temperatures. Additionally, the State is projected to experience more frequent droughts.





Droughts can cause deficits in surface and groundwater used for drinking water. The New York State Water Resources Institute at Cornell University conducted a vulnerability assessment of drinking water supplies and climate change. To assess water supplies in New York State, it was assumed that long-term average supply will remain the same, but the duration and/or frequency of dry periods may increase. Both types of water supplies, surface water and groundwater, were divided into three categories: sensitive to short droughts (two to three months), sensitive to moderate and longer droughts (greater than six months), and relatively sensitive to any droughts. Major reservoir systems are presumed to have moderate sensitivity to drought because there is a likelihood of decreases in summer and fall water availability (NYSERDA 2011). The greatest likelihood of future water shortages is likely to occur on small water systems.

Change of Vulnerability Since 2017 HMP

Monroe County continues to be vulnerable to the drought hazard. Updated population and building stock statistics were used in the current risk assessment. Further, exposure for both the population and critical facilities was analyzed. These updated datasets provide a more accurate exposure analysis to the drought hazard.





5.4.3 EARTHQUAKE

This section provides a profile and vulnerability assessment of the earthquake hazard for Monroe County.

5.4.3.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the earthquake hazard.

Hazard Description

An earthquake is the sudden movement of the Earth's surface caused by the release of stress accumulated within or along the edge of the Earth's tectonic plates, a volcanic eruption, or by a manmade explosion (FEMA 2013). Most earthquakes occur at the boundaries where the Earth's tectonic plates meet (faults); however, less than 10 percent of earthquakes occur within plate interiors. New York State is in an area where plate interior-related earthquakes occur. As plates continue to move and plate boundaries change over geologic time, weakened boundary regions become part of the interiors of the plates. These zones of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust (Shedlock and Pakiser 1997).

The location of an earthquake is commonly described by its focal depth and the geographic position of its epicenter. The focal depth of an earthquake is the depth from the Earth's surface to the region where an earthquake's energy originates (the focus or hypocenter). The epicenter of an earthquake is the point on the Earth's surface directly above the hypocenter (Shedlock and Pakiser 1997). Earthquakes usually occur without warning and their effects can impact areas of great distance from the epicenter.

According to the U.S. Geological Society (USGS) Earthquake Hazards Program, an earthquake hazard is anything associated with an earthquake that may affect resident's normal activities (FEMA 2001). This includes surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches. A description of each of these is provided below.

- *Surface faulting*: Displacement that reaches the earth's surface during slip along a fault. Commonly occurs with shallow earthquakes, those with an epicenter less than 20 kilometers.
- *Ground motion (shaking):* The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by sudden slip on a fault or sudden pressure at the explosive source and travel through the earth and along its surface.
- *Landslide*: A movement of surface material down a slope.
- *Liquefaction*: A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like when you wiggle your toes in the wet sand near the water at the beach. This effect can be caused by earthquake shaking.
- Tectonic Deformation: A change in the original shape of a material due to stress and strain.
- *Tsunami*: A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major submarine slides, or exploding volcanic islands.
- Seiche: The sloshing of a closed body of water from earthquake shaking (USGS 2012).

Location

As noted in the 2019 NYS HMP, the importance of the earthquake hazard in New York State is often underestimated because other natural hazards (for example, hurricanes and floods) occur more frequently and because major hurricanes and floods have occurred more recently than a major earthquake event (NYS DHSES





2019). However, the potential for earthquakes exists across all of New York State and the entire northeastern United States. The New York City Area Consortium for Earthquake Loss Mitigation (NYCEM) ranks New York State as having the third highest earthquake activity level east of the Mississippi River (Tantala 2003)

Three general regions in New York State have a higher seismic risk than other parts of the state. These regions are: (1) the north and northeast third of the state, which includes the North Country/Adirondack region and a portion of the greater Albany-Saratoga region; (2) the southeast corner, which includes the greater New York City area and western Long Island; and (3) the northwest corner, which includes Buffalo and its surrounding area. Overall, these three regions are the most seismically active areas of the state, with the north-northeast portion having the higher seismic risk, and the northwest corner of the state having the lower seismic risk (NYS DHSES 2014).

Fractures or fracture zones along with rocks on adjacent sides have broken and moved upward, downward, or horizontally are known as faults (Volkert and Witte 2015). Movement can take place at faults and cause an earthquake. There are numerous faults throughout New York State, and Figure 5.4.3-1 illustrates the faults relative to Monroe County (New York State Museum 2012).

The closest plate boundary to the East Coast is the Mid-Atlantic Ridge, which is approximately 2,000 miles east of Pennsylvania. Over 200 million years ago, when the continent Pangaea rifted apart forming the Atlantic Ocean, the northeast coast of America was a plate boundary. Being at the plate boundary, many faults were formed in the region. Although these faults are geologically old and are contained in a passive margin, they act as pre-existing planes of weakness and concentrated strain. When a strain exceeds the strength of the ancient fault, it ruptures causing an earthquake (PA DCNR 2007).

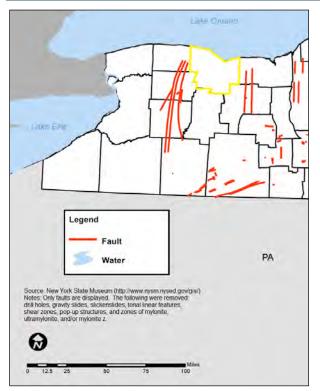


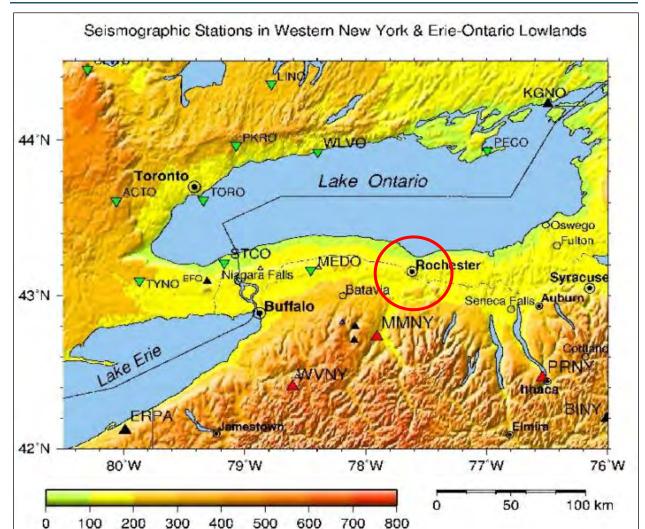
Figure 5.4.3-1. Faults in New York State

Source:New York State Museum 2012Note:Monroe County is outlined in yellow.





The Lamont-Doherty Cooperative Seismographic Network (LCSN) monitors earthquakes that occur primarily in the northeastern United States. The goals of the monitoring project are to compile a complete earthquake catalog for this region, to assess the earthquake hazards, and to study the causes of the earthquakes in the region. The LCSN operates 40 seismographic stations in the following seven states: Connecticut, Delaware, Maryland, New Jersey, New York, Pennsylvania, and Vermont. No seismographic stations are located in Monroe County; however, there are several within the vicinity of the County. Figure 5.4.3-2 shows the location of these stations in the western New York State area (LCSN 2014).





In addition to the Lamont-Doherty Seismic Stations, the USGS operates a global network of seismic stations to monitor seismic activity. While no seismic stations are located in New York State, nearby stations are positioned in State College, Pennsylvania, and Oak Ridge, Massachusetts. Figure 5.4.3-3 shows the locations of USGS seismic stations near New York State.



Source: LCSN 2012

Note: The red circle indicates the approximate location of Monroe County.



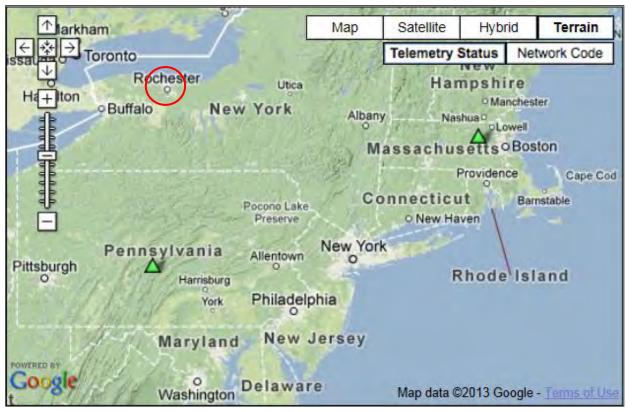


Figure 5.4.3-3. USGS Seismic Stations near New York State

Source:USGS 2015Note:The red circle indicates the approximate location of Monroe County.

Figure 5.4.3-4 illustrates historic earthquake epicenters across the northeast United States and in New York State between 1914 and 2022. There have been multiple earthquakes originating outside New York's borders that have been felt within the state. These quakes have come from Quebec, Canada; and Massachusetts. According to the NYS HMP, such events are considered significant for hazard mitigation planning because they could produce damage within the state in certain situations.





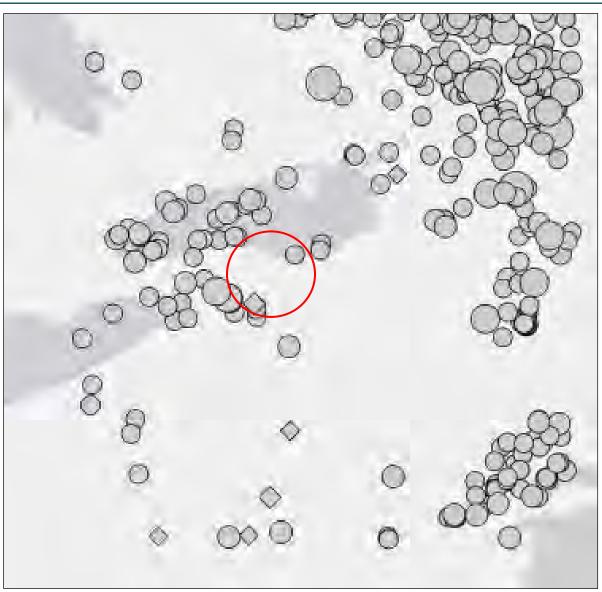


Figure 5.4.3-4. Earthquake Epicenters in the Northeast U.S., 1914 to 2022

Source:USGS 2022Note:The red circle indicates the approximate location of Monroe County.

Extent

An earthquake's magnitude and intensity are used to describe the severity and size of the event. intensity describes the overall felt severity of shaking during the event and magnitude describes the size at the focus of an earthquake. The earthquake's magnitude is a measure of the energy released at the source of the earthquake. Magnitude was formerly expressed by ratings on the Richter scale. It is now most commonly expressed using the moment magnitude (Mw) scale. This scale is based on the total moment release of the earthquake (the product of the distance a fault moved, and the force required to move it). The scale is as follows:

- Great Mw > 8
- Major Mw = 7.0 7.9
- Strong Mw = 6.0 6.9





- Moderate Mw = 5.0 5.9
- Light Mw = 4.0 4.9
- Minor Mw = 3.0 3.9
- Micro Mw = 3.0 3.9

The most commonly used intensity scale is the modified Mercalli intensity scale. Ratings of the scale, as well as the perceived shaking and damage potential for structures, are shown in Table 5.4.3-1. The modified Mercalli intensity scale is generally represented visually using shake maps, which show the expected ground shaking at any given location produced by an earthquake with a specified magnitude and epicenter. An earthquake has only one magnitude and one epicenter, but it produces a range of ground shaking at sites throughout the region. This shaking depends on the distance from the earthquake, the rock and soil conditions at sites, and variations in the propagation of seismic waves from the earthquake due to complexities in the structure of the earth's crust. A USGS shake map shows the variation of ground shaking in a region immediately following significant earthquakes. Table 5.4.3-2 displays the MMI scale and its relationship to the areas peak ground acceleration.

Mercalli Intensity	Shaking	Description
Ι	Not Felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibrations are similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing automobiles rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Felt by all. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Felt by all. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Felt by all. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X Source: US	Extreme	Felt by all. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Table 5.4.3-1. Modified Mercalli Intensity Scale

Source: USGS 2014

Table 5.4.3-2. Modified Mercalli Intensity (MMI) and PGA Equivalents

Modified Mercalli Intensity	Acceleration (%g) (PGA)	Perceived Shaking	Potential Damage
Ι	< .17	Not Felt	None
II	.17 – 1.4	Weak	None
III	.17 – 1.4	Weak	None
IV	1.4 - 3.9	Light	None
V	3.9-9.2	Moderate	Very Light
VI	9.2 - 18	Strong	Light
VII	18-34	Very Strong	Moderate





Modified Mercalli Intensity	Acceleration (%g) (PGA)	Perceived Shaking	Potential Damage
VIII	34 - 65	Severe	Moderate to Heavy
IX	65-124	Violent	Heavy
Х	>124	Extreme	Very Heavy

Freeman et al. (Purdue University) 2004 Source: Note: PGA Peak Ground Acceleration

The ground experiences acceleration as it shakes during an earthquake. The peak ground acceleration (PGA) is a measure of how hard the earth shakes in a given geographic area. It is expressed as a percentage of the acceleration due to gravity (percent g). Horizontal and vertical PGA varies with soil or rock type. Earthquake hazard assessment involves estimating the annual probability that certain ground accelerations will be exceeded, and then summing the annual probabilities over a period of interest. Damage levels experienced in an earthquake vary with the intensity of ground shaking and with the seismic capacity of structures, as noted in Figure 5.4.3-2 through Figure 5.4.3-4.

PGA expresses the severity of an earthquake and is a measure of how hard the earth shakes, or accelerates, in a given geographic area. PGA is expressed as a percent acceleration force of gravity (%g). For example, 1.0%g PGA in an earthquake (an extremely strong ground motion) means that objects accelerate sideways at the same rate as if they had been dropped from the ceiling. 10% g PGA means that the ground acceleration is 10% that of gravity (NJOEM 2013). Damage levels experienced in an earthquake vary with the intensity of ground shaking and with the seismic capacity of structures, as noted in Table 5.4.3-3.

Ground Motion Percentage	Explanation of Damages
1-2%g	Motions are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are usually very low.
Below 10%g	Usually causes only slight damage, except in unusually vulnerable facilities.
10 - 20%g	May cause minor-to-moderate damage in well-designed buildings, with higher levels of damage in poorly designed buildings. At this level of ground shaking, only unusually poor buildings would be subject to potential collapse.
20 - 50%g	May cause significant damage in some modern buildings and very high levels of damage (including collapse) in poorly designed buildings.
≥50%g	May causes higher levels of damage in many buildings, even those designed to resist seismic forces.

Table 5.4.3-3. Damage Levels Experienced in Earthquakes

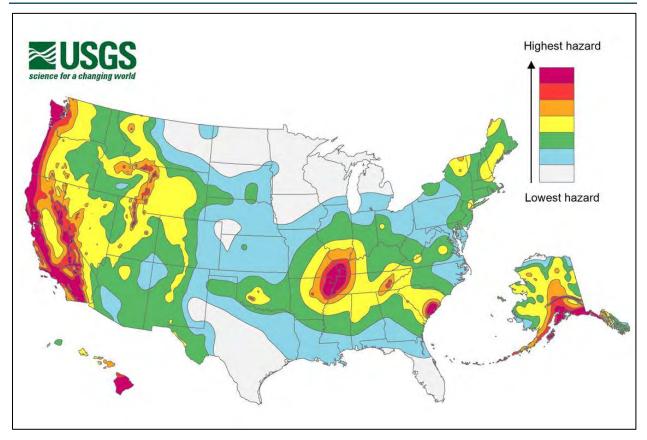
Note: %g Peak Ground Acceleration

National maps of earthquake shaking hazards provide information for creating and updating seismic design requirements for building codes, insurance rate structures, earthquake loss studies, retrofit priorities, and land use planning. After thorough review of the studies, professional organizations of engineers update the seismicrisk maps and seismic design requirements contained in building codes (Brown 2001) The USGS updated the National Seismic Hazard Maps in 2018. New seismic, geologic, and geodetic information on earthquake rates and associated ground shaking were incorporated into these revised maps. The 2018 map represents the best available data, as determined by the USGS.









Source: USGS 2018

The New York State Geological Survey conducted seismic shear-wave tests of the state's surficial geology (glacial deposits). Based on these test results, the surficial geologic materials of New York State were categorized according to the National Earthquake Hazard Reduction Program's (NEHRP) Soil Site Classifications (Table 5.4.3-4). The NEHRP developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from Class A to Class E, as noted in Table 5.4.3-4, where Class A represents hard rock that reduces ground motions from an earthquake and Class E represents soft soils that amplify and magnify ground shaking and increase building damage and losses. Class E soils include water-saturated mud and artificial fill. The strongest amplification of shaking due is expected for this soil type. Seismic waves travel faster through hard rock than through softer rock and sediments. As the waves pass from harder to softer rocks, the waves slow down, and their amplitude increases. Shaking tends to be stronger at locations with softer surface layers where seismic waves move more slowly. Ground motion above an unconsolidated landfill or soft soils can be more than 10 times stronger than at neighboring locations on rock for small ground motions (FEMA 2013).

Soil Classification	Description
А	Hard rock
В	Rock
С	Very dense soil and soft rock
D	Stiff soils
E	Soft soils

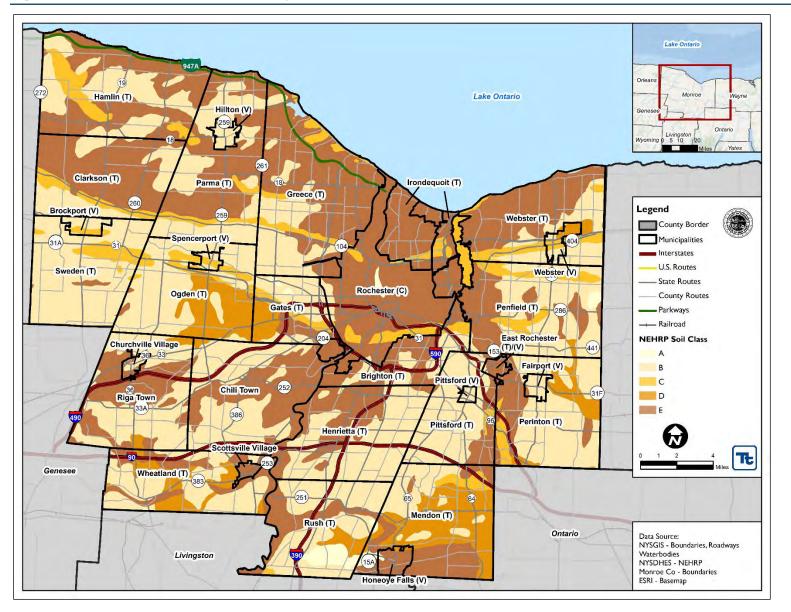
Table 5.4.3-4. NEHRP Soil Classifications

Source: FEMA 2013





Figure 5.4.3-6. NEHRP Soils in Monroe County





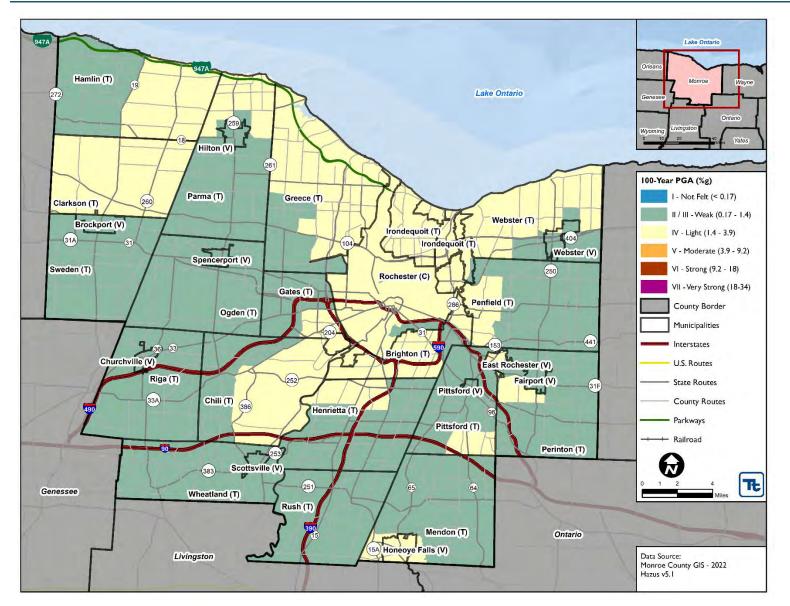
As illustrated in Figure 5.4.3-6, Monroe County is primarily comprised of NEHRP Soil Classes B, D, and E with the majority of the County comprised of Soil Classes B (rock) and E (soft soils).

A probabilistic assessment was conducted for the 100- and 500-year mean return periods (MRP) through a Level 2 analysis using the HAZUS-MH, Version 2.2 (HAZUS-MH) probabilistic model to analyze the earthquake hazard for Monroe County. The Level 2 HAZUS analysis evaluates the statistical likelihood that a specific event will occur and what consequences will occur. A 100-year MRP event is an earthquake with a 1 percent chance that the mapped ground motion levels (PGA) will be exceeded in any given year. For a 500-year MRP, there is a 0.2 percent chance the mapped PGA will be exceeded in any given year.

Figure 5.4.3-7 and Figure 5.4.3-8 illustrate the geographic distribution of PGA (g) across Monroe County for 100- and 500-year MRP events at the census tract level.

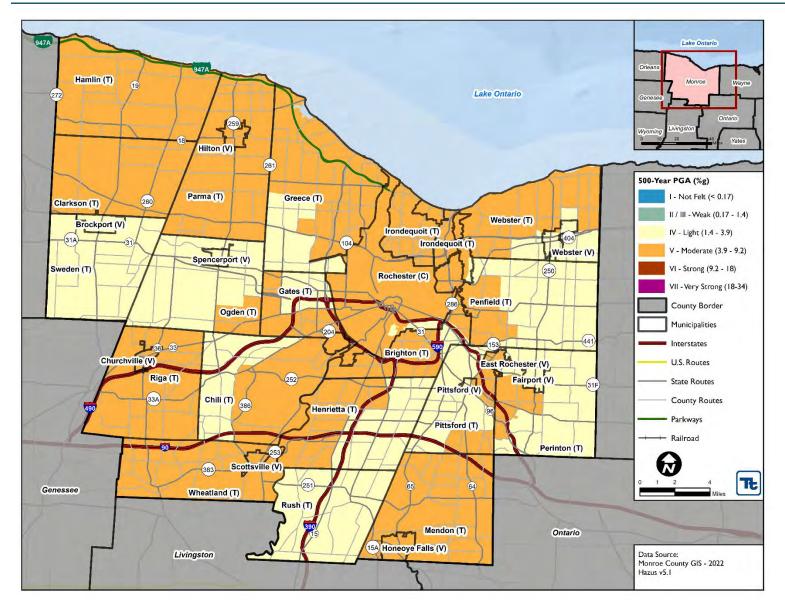
















Previous Occurrences and Losses

Many sources provided historical information on previous occurrences and losses associated with earthquakes throughout New York State. Therefore, with so many sources reviewed for the purpose of this HMP update, loss and impact information for many events could vary depending on the source.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State was included in one earthquake-related major disaster (DR) or emergency (EM) declaration. Generally, these disasters cover a wide region of the state; therefore, they may have impacted many counties. However, not all counties were included in the disaster declaration. Monroe County has not been included in any DRs or EMs (FEMA 2022).

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was not included in any USDA declarations involving earthquake events.

Previous Events

Table 5.4.3-5 identifies known earthquake events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





 Table 5.4.3-5. Earthquake Events in Monroe County, 2015 to 2022

Dates of Event	Magnitude (Richter Scale)	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
August 15, 2022	Magnitude 1.2	3.7 miles west northwest of Le Roy, New York	N/A	No	A 1.2-magnitude earthquake near Le Roy, New York struck around 6:37 a.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
March 15, 2022	Magnitude 2.6	3.1 miles south southwest of Warsaw, New York	N/A	No	A 2.6-magnitude earthquake near Warsaw, New York struck around 3:11 p.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
February 9, 2021	Magnitude 1.9	3.7 miles west of Bergen, New York	N/A	No	A 1.9-magnitude earthquake near Bergen, New York struck around 3:43 a.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
March 29, 2020	Magnitude 2.6	6.8 miles north of Lyndonville, New York	N/A	No	A 2.6-magnitude earthquake near Lyndonville, New York struck around 5:04 p.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
December 18, 2019	Magnitude 2.1	8 miles north northeast of Sodus Point, New York	N/A	No	A 2.1-magnitude earthquake near Sodus Point, New York struck around 7:40 a.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
February 13, 2019	Magnitude 2.0	14.2 miles northwest of Hamlin, New York	N/A	No	A 2.0-magnitude earthquake near Hamlin, New York struck around 7:29 p.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
June 12, 2018	Magnitude 1.1	4.9 miles north northwest of Ontario, New York	N/A	No	A 1.1-magnitude earthquake near Ontario, New York struck around 2:07 p.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
May 8, 2018	Magnitude 3.0	8.7 miles Southeast of Ajax, Canada	N/A	No	A 3.0-magnitude earthquake near Ajax, Canada struck around 9:27 p.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
November 30, 2017	Magnitude 4.1	1.8 miles north northeast of Little Creek, Delaware	N/A	No	A 4.1 magnitude earthquake near Little Creek, Delaware struck around 9:47 p.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.
July 11, 2017	Magnitude 2.5	6.8 miles north northwest of Barker, New York	N/A	No	A 2.5-magnitude earthquake struck near Barker, New York at 6:27 a.m. according to the U.S. Geological Survey. The quake was weakly felt in Monroe County.

Source: USGS 2022; FEMA 2022

Note: All magnitudes referenced refer to the Richter Scale, unless otherwise specified.

USGS United States Geological Survey





Climate Change Impacts

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts.

Probability of Future Occurrences

Earthquake hazard maps illustrate the distribution of earthquake shaking levels that have a certain probability of occurring over a given time period. According to the USGS, in 2017 (the date of the most recent analysis), Monroe County had a PGA of 0.06g to 0.1g for earthquakes with a 10 percent probability of an occurrence within 50 years.

The NYSDPC indicates that the earthquake hazard in New York State is often understated because other natural hazards occur more frequently (such as hurricanes, tornadoes, and flooding) and are much more visible. However, the potential for earthquakes does exist across the entire northeastern United States, including New York State and Monroe County (NYS DHSES 2019).

Based on historical records and input from the Steering Committee, the probability of occurrence for earthquakes in the County is considered "unlikely" (not likely to occur or less than one percent annual chance of occurring as presented in Table 5.3-2). It is anticipated that the County will experience some direct and indirect impacts from earthquakes that may affect the general building stock and local economy, and may induce secondary hazards such as igniting fires and causing utility failure.

5.4.3.2 Vulnerability Assessment

A probabilistic assessment was conducted for the 100-year, 500-year, and 2,500-year Mean Return Period (MRP) events through a Level 2 analysis in Hazus to analyze the earthquake hazard and provide a range of loss estimates. Refer to Section 5.1 (Methodology and Tools) for additional details on the methodology used to assess earthquake risk.

Impact on Life, Health and Safety

While the entire population of Monroe County can experience impacts from the earthquake hazard, those living in more vulnerable areas are more susceptible. An exposure analysis was performed using the NEHRP soils data and the 2020 Census population data. The sum of the population by census block within the NEHRP Class D and E soil types were calculated and summarized in Table 5.4.3-6 below. Overall, approximately 59.4 percent of the County's population is located on NEHRP Class D and E soils.

The impact of an earthquake on life, health, and safety is dependent upon the severity of the event. Risk to public safety and loss of life from an earthquake in the County is minimal. However, a higher risk would occur in for those inside buildings, due to structural damage, or people walking below building ornamentation and chimneys that may be loose and fall as a result of the earthquake.





Populations considered most vulnerable are located in the built environment, particularly near unreinforced masonry construction. In addition, the vulnerable population includes the elderly (persons over the age of 65, 16.9 percent of the County population) and individuals living below the census poverty threshold (13.3 percent of the County population (U.S. Census 2020). These socially vulnerable populations are most susceptible, based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing.

		Population NEHRP Class "D" and "E" Soils		
Municipality	Total Population (2020 Census)	Total Population Exposed	% of Population Exposed	
Brighton (T)	37,137	21,031	56.6%	
Brockport (V)	7,104	0	0.0%	
Chili (T)	29,123	10,735	36.9%	
Churchville (V)	2,091	507	24.3%	
Clarkson (T)	6,904	3,254	47.1%	
East Rochester (V/T)	6,334	5,854	92.4%	
Fairport (V)	5,501	521	9.5%	
Gates (T)	29,167	6,541	22.4%	
Greece (T)	96,926	67,479	69.6%	
Hamlin (T)	8,725	3,894	44.6%	
Henrietta (T)	47,096	16,078	34.1%	
Hilton (V)	6,027	290	4.8%	
Honeoye Falls (V)	2,706	2,684	99.2%	
Irondequoit (T)	51,043	47,525	93.1%	
Mendon (T)	6,389	5,035	78.8%	
Ogden (T)	16,585	5,809	35.0%	
Parma (T)	10,190	3,934	38.6%	
Penfield (T)	39,438	13,103	33.2%	
Perinton (T)	39,128	12,355	31.6%	
Pittsford (T)	25,714	5,786	22.5%	
Pittsford (V)	1,419	0	0.0%	
Riga (T)	3,495	1,198	34.3%	
Rochester (C)	211,328	183,892	87.0%	
Rush (T)	3,490	817	23.4%	
Scottsville (V)	2,009	1,890	94.1%	
Spencerport (V)	3,685	0	0.0%	
Sweden (T)	6,140	18	0.3%	
Webster (T)	39,676	25,282	63.7%	
Webster (V)	5,651	63	1.1%	
Wheatland (T)	2,888	1,634	56.6%	
Monroe County (Total)	753,109	447,211	59.4%	

Table 5.4.3-6. Approximate Population within NEHRP 'D' and 'E' Soils

Source: NYS DHSES 2022; U.S. Census 2020 Notes: C City T Town

Village

V

Residents may be displaced or require temporary to long-term sheltering. The number of people requiring shelter is generally less than the number displaced as some displaced persons use hotels or stay with family or friends following a disaster event. Table 5.4.3-7 and Table 5.4.3-8 estimate the number of households displaced, and population that may require short-term sheltering as a result of the 100- and 500- MRP earthquake events.





Table 5.4.3-7. Summary of Estimated Sheltering Needs for Monroe County

Scenario	Displaced Households	Persons Seeking Short-Term Shelter	
100-Year Earthquake	0	0	
500-Year Earthquake	1	1	

Source: HAZUS v5.1

Table 5.4.3-8. Estimated Displaced Households and Population Seeking Short-Term Shelter from the100- and 500-year MRP Events per Municipality

	100-Ye	ar MRP Event	500-Y	/ear MRP Event
Municipality	Displaced Households	Persons Seeking Short-Term Sheltering	Displaced Households	Persons Seeking Short- Term Sheltering
Brighton (T)	0	0	0	0
Brockport (V)	0	0	0	0
Chili (T)	0	0	0	0
Churchville (V)	0	0	0	0
Clarkson (T)	0	0	0	0
East Rochester (T/V)	0	0	0	0
Fairport (V)	0	0	0	0
Gates (T)	0	0	0	0
Greece (T)	0	0	0	0
Hamlin (T)	0	0	0	0
Henrietta (T)	0	0	0	0
Hilton (V)	0	0	0	0
Honeoye Falls (V)	0	0	0	0
Irondequoit (T)	0	0	0	0
Mendon (T)	0	0	0	0
Ogden (T)	0	0	0	0
Parma (T)	0	0	0	0
Penfield (T)	0	0	0	0
Perinton (T)	0	0	0	0
Pittsford (T)	0	0	0	0
Pittsford (V)	0	0	0	0
Riga (T)	0	0	0	0
Rochester (C)	0	0	1	1
Rush (T)	0	0	0	0
Scottsville (V)	0	0	0	0
Spencerport (V)	0	0	0	0
Sweden (T)	0	0	0	0
Webster (T)	0	0	0	0
Webster (V)	0	0	0	0
Wheatland (T)	0	0	0	0
Monroe County (Total)	0	0	1	1

Source: HAZUS v5.1

Notes: C City

T Town

V Village





According to the 1999-2003 NYCEM Summary Report (*Earthquake Risks and Mitigation in the New York / New Jersey / Connecticut Region*), a strong correlation exists between structural building damage and the number of injuries and casualties from an earthquake event. Further, the time of day also exposes different sectors of the community to the hazard. For example, Hazus considers the residential occupancy at its maximum at 2:00 a.m., where the educational, commercial and industrial sectors are at their maximum at 2:00 p.m., and peak commute time is at 5:00 p.m. Whether directly impacted or indirectly impacted, the entire population will be affected to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations that suffered no direct damage from an event itself.

Table 5.4.3-9 and Table 5.4.3-10 summarize the County-wide injuries and casualties estimated for the 500- and 2,500-year MRP earthquake events, respectively.

	Time of Day				
Level of Severity	2:00 AM	2:00 PM	5:00 PM		
Injuries	0	2	0		
Hospitalization	0	0	0		
Casualties	0	0	0		

Table 5.4.3-9. Estimated Number of Injuries and Casualties from the 100-Year MRP Earthquake Event

Source: HAZUS-MH 2.2

Table 5.4.3-10. Estimated Number of Injuries and Casualties from the 500-Year MRP Earthquake Event

	Time of Day				
Level of Severity	2:00 AM	2:00 PM	5:00 PM		
Injuries	7	44	17		
Hospitalization	0	6	2		
Casualties	0	1	0		

Source: HAZUS-MH 2.2

Impact on General Building Stock

The entire County's general building stock is considered at risk and exposed to this hazard. As stated earlier, soft soils (NEHRP Soil Classes D and E) can amplify ground shaking to damaging levels even in a moderate earthquake (Tantala 2003). Therefore, buildings located on NEHRP Soil Classes D and E have an increased risk of damages from an earthquake. Table 5.4.3-11 summarizes the number and replacement cost value of buildings in Monroe County on the approximately located NEHRP Soil Classes D and E.

Table 5.4.3-11. Number and Replacement Cost Value of Buildings Located in NEHRP 'D' and 'E' Soils

			Buildings NEHRP Class "D" and "E" Soils			
Municipality	Total Number of Buildings	Total RCV (Structure and Contents)	Number Exposed	% of Total Number	RCV Exposed	% of Total RCV
Brighton (T)	11,693	\$14,443,886,002	6,745	57.7%	\$9,120,976,752	63.1%
Brockport (V)	2,224	\$5,158,789,593	0	0.0%	\$0	0.0%
Chili (T)	11,534	\$9,206,843,886	4,371	37.9%	\$4,829,957,133	52.5%
Churchville (V)	1,112	\$938,164,078	323	29.0%	\$361,991,364	38.6%





			Buildings NEHRP Class "D" and "E" Soils			
Municipality	Total Number of Buildings	Total RCV (Structure and Contents)	Number Exposed	% of Total Number	RCV Exposed	% of Total RCV
Clarkson (T)	3,411	\$1,887,392,030	1,662	48.7%	\$778,414,759	41.2%
East Rochester (V/T)	2,924	\$3,440,171,127	2,721	93.1%	\$3,371,749,070	98.0%
Fairport (V)	3,411	\$2,281,456,076	1,662	48.7%	\$778,414,759	34.1%
Gates (T)	11,801	\$12,220,599,285	2,768	23.5%	\$6,348,222,672	51.9%
Greece (T)	36,414	\$26,954,378,684	25,312	69.5%	\$18,439,665,019	68.4%
Hamlin (T)	5,539	\$2,318,778,027	2,680	48.4%	\$1,261,583,152	54.4%
Henrietta (T)	15,982	\$23,460,566,322	5,718	35.8%	\$12,975,583,549	55.3%
Hilton (V)	2,143	\$2,120,287,988	92	4.3%	\$30,238,461	1.4%
Honeoye Falls (V)	1,155	\$1,813,180,690	1,146	99.2%	\$1,809,236,064	99.8%
Irondequoit (T)	21,885	\$13,427,006,840	20,235	92.5%	\$10,732,745,572	79.9%
Mendon (T)	3,835	\$2,852,155,914	2,974	77.5%	\$2,233,498,663	78.3%
Ogden (T)	7,407	\$5,558,087,440	2,613	35.3%	\$2,007,919,269	36.1%
Parma (T)	5,509	\$3,373,412,574	2,233	40.5%	\$1,166,956,414	34.6%
Penfield (T)	15,882	\$11,119,233,991	5,249	33.0%	\$4,079,557,147	36.7%
Perinton (T)	16,817	\$13,125,415,407	5,328	31.7%	\$4,494,111,306	34.2%
Pittsford (T)	10,590	\$10,686,774,001	2,417	22.8%	\$1,654,747,882	15.5%
Pittsford (V)	804	\$1,776,834,511	0	0.0%	\$0	0.0%
Riga (T)	2,356	\$1,539,492,845	878	37.3%	\$588,372,873	38.2%
Rochester (C)	89,392	\$119,943,371,056	77,734	87.0%	\$108,639,791,200	90.6%
Rush (T)	2,808	\$1,816,445,354	683	24.3%	\$482,651,643	26.6%
Scottsville (V)	1,069	\$908,716,753	1,001	93.6%	\$897,233,362	98.74%
Spencerport (V)	1,654	\$1,580,844,696	0	0.0%	\$0	0.00%
Sweden (T)	3,465	\$3,402,258,236	9	0.3%	\$3,296,699	0.10%
Webster (T)	16,660	\$11,510,191,170	10,229	61.4%	\$5,840,470,418	50.74%
Webster (V)	1,633	\$3,634,066,282	76	4.7%	\$1,769,948,381	48.70%
Wheatland (T)	1,926	\$2,509,077,040	991	51.5%	\$1,361,442,516	54.26%
Monroe County (Total)	312,018	\$315,007,877,898	186,384	59.7%	\$206,058,776,099	65.41%

Sources: NYS DHSES 2020, U.S. Census 2020; Monroe County GIS 2022

Note: RCV is the estimated replacement cost value of both structure and contents.

C City

T Town V Village

According to NYCEM, where earthquake risks and mitigation were evaluated in the New York, New Jersey, and Connecticut region, most damage and loss caused by an earthquake is directly or indirectly the result of ground shaking (Tantala 2003). There is a strong correlation between PGA and damage a building might undergo (NYCEM 2003). The Hazus model is based on best available earthquake science and aligns with these statements. The Hazus probabilistic earthquake model was applied to analyze effects from the earthquake hazard





on general building stock in Erie County. See Figure 5.4.3-7 and Figure 5.4.3-8 illustrating the geographic distribution of PGA (%g) across the County for 100- and 500-year MRP events at the census-tract level.

A building's construction determines how well it can withstand the force of an earthquake. The NYCEM report indicates that unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward, whereas steel and wood buildings absorb more of the earthquake's energy. Additional attributes that affect a building's capability to withstand an earthquake's force include its age, number of stories, and quality of construction. Hazus considers building construction and age of building as part of the analysis. Because a custom general building stock was used for this analysis, the building ages and building types from the inventory were incorporated into the Hazus model.

Potential building damage was evaluated by Hazus across the following damage categories (none, slight, moderate, extensive, and complete). Table 5.4.3-12 provides definitions of these five categories of damage for a light wood-framed building; definitions for other building types are included in Hazus technical manual documentation.

Table 5.4.3-12. Example of Structural Damage State Definitions for a Light Wood-Framed Building

Damage Category	Description
Slight	Small plaster or gypsum-board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: HAZUS Technical Manual

Building damage as a result of the 500-year MRP earthquake events was estimated using Hazus. Damage loss estimates include structural and non-structural damage to the building and loss of contents. Table 5.4.3-13 and Table 5.4.3-14 summarize the damage estimated for the 100- and 500-year MRP earthquake events. Damage loss estimates include structural and non-structural damage to the building and loss of contents. Hazus estimates that 23 structures in the County will face extensive damage from a 500-year earthquake event.

Table 5.4.3-13. Estimated Buildings Damaged by General Occupancy for 100-year MRP Earthquake Events

	Total Number of		Earthquake 100-Year			
Occupancy Class	Buildings in Occupancy	Severity of Expected Damage	Building Count	Percent Buildings in Occupancy Class		
		None	246,742	100.0%		
Residential Exposure		Slight	61	0.0%		
(Single and Multi-	246,803	Moderate	0	0.0%		
Family Dwellings)		Extensive	0	Percent Buildings in Occupancy Class 100.0% 0.0% 0.0% 0.0% 0.0% 0.1% 0.1% 0.0%		
		Complete Destruction	0	0.0%		
		None	59,042	99.9%		
Commercial Buildings	50 100	Slight	50	0.1%		
Commercial Buildings	59,100	Moderate	7	0.0%		
		Extensive	0	0.0%		





	Total Number of		Earthquak	e 100-Year
Occupancy Class	Buildings in Occupancy	Severity of Expected Damage	Building Count	Percent Buildings in Occupancy Class
		Complete Destruction	0	0.0%
		None	1,502	99.4%
		Slight	6	0.4%
Industrial Buildings	1,511	Moderate	2	0.1%
		Extensive	0	0.0%
		Complete Destruction	0	0.0%
		None	4,492	99.9%
Government,		Slight	5	0.1%
Religion, Agricultural, and Education	4,498	Moderate	1	0.0%
Buildings		Extensive	0	0.0%
6		Complete Destruction	0	0.0%

Source: HAZUS v5.1

Notes: Due to the differences in the boundaries of Census Tracts used in the Hazus model, the number of structures assessed in the Hazus model may underestimate the number of structures located in the County.

Table 5.4.3-14. Estimated Buildings Damaged by General Occupancy for 500-year MRP Earthquake Events

	Total Number of		Earthquak	e 500-Year		
Occupancy Class	Buildings in Occupancy	Severity of Expected Damage	Building Count	Percent Buildings in Occupancy Class		
		None	243,475	98.7%		
Residential Exposure		Slight	3,015	1.2%		
(Single and Multi-	246,803	Moderate	312	0.1%		
Family Dwellings)		Extensive	1	0.0%		
		Complete Destruction	0	0.0%		
		None	57,099	96.6%		
Commercial Buildings		Slight	1,524	2.6%		
	59,100	Moderate	458	0.8%		
		Extensive	17	0.1% 0.0% 0.0% 96.6% 2.6%		
		Complete Destruction	2	0.0%		
		None	1,387	91.8%		
		Slight	$\begin{array}{c c c c c c c c c c c c c c c c c c c $			
Industrial Buildings	1,511	Moderate	35	2.3%		
		Extensive	6	0.4%		
		Complete Destruction	1	0.0%		
		None	4,349	96.7%		
Government,		Slight	113	2.5%		
Religion, Agricultural, and Education	4,498	Moderate	31	0.7%		
and Education Buildings		Extensive	4	0.1%		
Dunungo		Complete Destruction	0	0.0%		

Source: HAZUS v5.1

Notes: Due to the differences in the boundaries of Census Tracts used in the Hazus model, the number of structures assessed in the Hazus model may underestimate the number of structures located in the County.

Table 5.4.3-15 and Table 5.4.3-16 also break down estimated damages by the structural general occupancy class for each jurisdiction.





Table 5.4.3-15. Estimated Replacement Cost Value (Building and Contents) Damaged by the 100-Year MRP Earthquake Event

				100-Year MR	р	
Jurisdiction	Total Replacement Cost Value (RCV)	Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damages for All Other Occupancies
Brighton (T)	\$14,443,886,002	\$701	<0.1%	\$37	\$155	\$509
Brockport (V)	\$5,158,789,593	\$0	0.0%	\$0	\$0	\$0
Chili (T)	\$9,206,843,886	\$13,374	<0.1%	\$593	\$10,671	\$2,111
Churchville (V)	\$938,164,078	\$0	0.0%	\$0	\$0	\$0
Clarkson (T)	\$1,887,392,030	\$0	0.0%	\$0	\$0	\$0
East Rochester (T/V)	\$3,440,171,127	\$45,189	<0.1%	\$6,798	\$21,069	\$17,322
Fairport (V)	\$2,281,456,076	\$0	0.0%	\$0	\$0	\$0
Gates (T)	\$12,220,599,285	\$3,715	<0.1%	\$165	\$2,964	\$586
Greece (T)	\$26,954,378,684	\$308,231	<0.1%	\$86,937	\$76,055	\$145,240
Hamlin (T)	\$2,318,778,027	\$0	0.0%	\$0	\$0	\$0
Henrietta (T)	\$23,460,566,322	\$0	0.0%	\$0	\$0	\$0
Hilton (V)	\$2,120,287,988	\$0	0.0%	\$0	\$0	\$0
Honeoye Falls (V)	\$1,813,180,690	\$0	0.0%	\$0	\$0	\$0
Irondequoit (T)	\$13,427,006,840	\$269,664	<0.1%	\$80,714	\$63,084	\$125,866
Mendon (T)	\$2,852,155,914	\$0	0.0%	\$0	\$0	\$0
Ogden (T)	\$5,558,087,440	\$0	0.0%	\$0	\$0	\$0
Parma (T)	\$3,373,412,574	\$0	0.0%	\$0	\$0	\$0
Penfield (T)	\$11,119,233,991	\$37,206	<0.1%	\$21,144	\$6,216	\$9,847
Perinton (T)	\$13,125,415,407	\$314	< 0.1%	\$47	\$146	\$120
Pittsford (T)	\$10,686,774,001	\$79	<0.1%	\$12	\$37	\$30
Pittsford (V)	\$1,776,834,511	\$0	0.0%	\$0	\$0	\$0
Riga (T)	\$1,539,492,845	\$0	0.0%	\$0	\$0	\$0
Rochester (C)	\$119,943,371,056	\$4,448,286	<0.1%	\$339,450	\$2,749,942	\$1,358,893
Rush (T)	\$1,816,445,354	\$0	0.0%	\$0	\$0	\$0
Scottsville (V)	\$908,716,753	\$0	0.0%	\$0	\$0	\$0
Spencerport (V)	\$1,580,844,696	\$0	0.0%	\$0	\$0	\$0
Sweden (T)	\$3,402,258,236	\$0	0.0%	\$0	\$0	\$0
Webster (T)	\$11,510,191,170	\$0	0.0%	\$0	\$0	\$0
Webster (V)	\$3,634,066,282	\$0	0.0%	\$0	\$0	\$0
Wheatland (T)	\$2,509,077,040	\$0	0.0%	\$0	\$0	\$0
Monroe County (Total)	\$315,007,877,898	\$5,126,759	0.0%	\$535,896	\$2,930,339	\$1,660,524

Source: Hazus v5.1; RS Means - 2022; Monroe County GIS - 2022

T Town

V Village



Notes: C City



Table 5.4.3-16. Estimated Replacement Cost Value (Building and Contents) Damaged by the 500-Year **MRP Earthquake Event**

				500-Year MRP)	
Jurisdiction	Total Replacement Cost Value (RCV)	Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damages for All Other Occupancies
Brighton (T)	\$14,443,886,002	\$8,987,671	0.1%	\$2,439,997	\$3,313,859	\$3,233,815
Brockport (V)	\$5,158,789,593	\$337,136	<0.1%	\$20,469	\$64,161	\$252,506
Chili (T)	\$9,206,843,886	\$3,449,473	<0.1%	\$796,050	\$1,590,039	\$1,063,384
Churchville (V)	\$938,164,078	\$336,416	<0.1%	\$56,634	\$131,134	\$148,647
Clarkson (T)	\$1,887,392,030	\$1,156,231	0.1%	\$372,922	\$724,399	\$58,910
East Rochester (T/V)	\$3,440,171,127	\$4,753,707	0.1%	\$559,357	\$2,817,302	\$1,377,047
Fairport (V)	\$2,281,456,076	\$209,646	<0.1%	\$37,042	\$68,314	\$104,290
Gates (T)	\$12,220,599,285	\$3,723,900	<0.1%	\$481,079	\$1,130,772	\$2,112,049
Greece (T)	\$26,954,378,684	\$17,822,176	0.1%	\$7,435,348	\$5,537,634	\$4,849,195
Hamlin (T)	\$2,318,778,027	\$1,031,236	<0.1%	\$406,420	\$501,396	\$123,419
Henrietta (T)	\$23,460,566,322	\$16,038,585	0.1%	\$1,573,017	\$6,171,230	\$8,294,338
Hilton (V)	\$2,120,287,988	\$827,004	<0.1%	\$155,765	\$322,844	\$348,395
Honeoye Falls (V)	\$1,813,180,690	\$1,898,599	0.1%	\$229,302	\$803,481	\$865,816
Irondequoit (T)	\$13,427,006,840	\$13,507,035	0.1%	\$5,327,547	\$5,435,445	\$2,744,042
Mendon (T)	\$2,852,155,914	\$1,073,045	<0.1%	\$313,601	\$570,767	\$188,677
Ogden (T)	\$5,558,087,440	\$774,269	<0.1%	\$250,399	\$196,643	\$327,227
Parma (T)	\$3,373,412,574	\$1,282,299	<0.1%	\$432,785	\$661,917	\$187,596
Penfield (T)	\$11,119,233,991	\$4,219,072	<0.1%	\$1,864,065	\$1,148,635	\$1,206,371
Perinton (T)	\$13,125,415,407	\$3,026,973	<0.1%	\$1,159,961	\$801,826	\$1,065,186
Pittsford (T)	\$10,686,774,001	\$1,650,582	<0.1%	\$521,209	\$252,816	\$876,558
Pittsford (V)	\$1,776,834,511	\$82,435	<0.1%	\$19,419	\$35,029	\$27,986
Riga (T)	\$1,539,492,845	\$711,812	<0.1%	\$119,855	\$277,302	\$314,655
Rochester (C)	\$119,943,371,056	\$171,981,069	0.1%	\$17,858,065	\$114,240,481	\$39,882,522
Rush (T)	\$1,816,445,354	\$278,622	<0.1%	\$59,291	\$125,892	\$93,439
Scottsville (V)	\$908,716,753	\$329,720	<0.1%	\$51,577	\$108,887	\$169,257
Spencerport (V)	\$1,580,844,696	\$255,023	<0.1%	\$33,921	\$55,487	\$165,615
Sweden (T)	\$3,402,258,236	\$357,665	<0.1%	\$34,588	\$76,072	\$247,006
Webster (T)	\$11,510,191,170	\$6,309,481	0.1%	\$2,688,727	\$1,448,070	\$2,172,683
Webster (V)	\$3,634,066,282	\$377,655	<0.1%	\$63,403	\$61,345	\$252,908
Wheatland (T)	\$2,509,077,040	\$593,157	<0.1%	\$92,787	\$195,934	\$304,435
Monroe County (Total)	\$315,007,877,898	\$267,381,692	0.1%	\$45,454,604	\$148,869,114	\$73,057,974

Source: Hazus v5.1; RS Means - 2022; Monroe County GIS - 2022

Notes: CCity Т

V

Town

Village

Hazus estimated approximately \$267 million in damage as a result of the 500-year earthquake event. This includes structural damage, non-structural damage, and loss of contents, representing 0.1-percent of the total replacement value for general building stock in Monroe County. Commercial buildings account for most of the damage for earthquake event.





Impact on Critical Facilities

After considering the general building stock exposed to, and damaged by, 100- and 500-year MRP earthquake events, critical facilities were evaluated. All critical facilities (essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities, and user-defined facilities) in Monroe County are considered exposed and vulnerable to the earthquake hazard. Refer to subsection "Critical Facilities" in Section 4 (County Profile) of this plan for a complete inventory of critical facilities in Monroe County. Table 5.4.3-17 summarizes the number of critical facilities by type located on NEHRP soil classes D and E.

	Total				and Lifeline Fac EHRP Soil D &	
Jurisdiction	Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Brighton (T)	69	65	43	62.3%	41	63.1%
Brockport (V)	29	28	0	0.0%	0	0.0%
Chili (T)	111	102	58	52.3%	53	52.0%
Churchville (V)	24	23	8	_33.3%	8	34.8%
Clarkson (T)	14	10	1	7.1%	1	10.0%
East Rochester (T/V)	31	29	31	100.0%	29	100.0%
Fairport (V)	17	16	0	0.0%	0	0.0%
Gates (T)	58	54	15	25.9%	11	20.4%
Greece (T)	165	158	119	72.1%	113	71.5%
Hamlin (T)	23	22	8	34.8%	8	36.4%
Henrietta (T)	111	103	33	29.7%	29	28.2%
Hilton (V)	21	20	0	0.0%	0	0.0%
Honeoye Falls (V)	17	16	17	100.0%	16	100.0%
Irondequoit (T)	103	100	90	87.4%	88	88.0%
Mendon (T)	21	20	14	66.7%	13	65.0%
Ogden (T)	42	38	11	26.2%	10	26.3%
Parma (T)	18	16	4	22.2%	4	25.0%
Penfield (T)	73	68	19	26.0%	18	26.5%
Perinton (T)	64	57	16	25.0%	14	24.6%
Pittsford (T)	45	39	5	11.1%	5	12.8%
Pittsford (V)	14	13	0	0.0%	0	0.0%
Riga (T)	20	18	4	20.0%	4	22.2%
Rochester (C)	639	605	565	88.4%	534	88.3%
Rush (T)	29	26	13	44.8%	12	46.2%
Scottsville (V)	14	13	14	100.0%	13	100.0%
Spencerport (V)	13	13	0	0.0%	0	0.0%
Sweden (T)	11	11	0	0.0%	0	0.0%
Webster (T)	55	53	31	56.4%	31	58.5%
Webster (V)	16	15	2	12.5%	1	6.7%
Wheatland (T)	23	21	15	65.2%	13	61.9%
Monroe County (Total)	1,890	1,773	1,136	60.1%	1,069	60.3%

Table 5.4.3-17. Number of Critical Facilities Located Exposed to NEHRP D & E Soils

Source: Monroe County GIS – 2022; NYSDHSES 2022

Table 5.4.3-18 separates the critical facilities exposed to NEHRP soil by the lifeline category. A majority of the exposed lifelines fall under the transportation category.

Table 5.4.3-18. Number of Lifelines Exposed to NEHRP D Soils

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Exposed to Class D and E NEHRP Soils
Communications	68	41





FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Exposed to Class D and E NEHRP Soils
Energy	14	9
Food, Water, Shelter	286	148
Hazardous Material	1	1
Health and Medical	93	61
Safety and Security	1,274	797
Transportation	36	12
Monroe County (Total)	1,772	1,069

Source: Monroe County GIS – 2022; NYSDHSES 2022

Hazus estimates the probability that critical facilities may sustain damage as a result of the 100- and 500-year MRP earthquake events. Additionally, Hazus estimates percent functionality for each facility days after the event. As a result of a 500-Year MRP event, Hazus estimates that emergency facilities (EOC, medical facilities, police, fire, EMS and schools) and highway bridges identified by Monroe County as critical will be nearly 93 percent functional. Table 5.4.3-19 and Table 5.4.3-20 list the percent probability of critical facilities sustaining the damage category as defined by the column heading and percent functionality after the event for the 500- and 2,500-year MRP earthquake events.

Table 5.4.3-19. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities for the100-Year MRP Earthquake Event

		Percent Prob	ability of Sus	taining Damag	e	Percent Functionality				
Name	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90	
Critical Facilities										
EOC	99.3%	0.6%	0.1%	<0.1%	0.0%	99.2%	99.8%	99.9%	99.9%	
Medical Facilities	99.9%	0% - 0.1%	0.0%	0.0%	0.0%	99.8% - 99.9%	99.9%	99.9%	99.9%	
Police Stations	99.2% - 99.9%	<0.1% - 0.6%	0.0% - 0.1%	0.0% - <0.1%	0.0%	99.1% - 99.9%	99.8% - 99.9%	99.9%	99.9%	
Fire Stations/EMS	99.2% - 99.9%	<0.1% - 0.7%	0.0% - 0.2%	0.0% - <0.1%	0.0%	99.0% - 99.9%	99.8% - 99.9%	99.9%	99.9%	
Schools	99.2% - 99.9%	<0.1% - 0.7%	0.0% - 0.2%	0.0% - <0.1%	0.0%	99.0% - 99.9%	99.8% - 99.9%	99.9%	99.9%	
Transportation										
Highway Bridges	1.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0 %	

Source: Hazus v5.1; Monroe County GIS - 2022

Notes: No results were available for Military, Utilities, Airports, or Bus Facilities.

City

V

C

T Town

Village

Table 5.4.3-20. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities for the500-Year MRP Earthquake Event

		Percent Prob	ability of Susta	ining Damage		Р	ercent Fu	nctionali	ty
Name	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilitie	es			-	-	-	-	-	-
EOC	92.7%	5.2%	2.0%	0.2%	<0.1%	92.6%	97.7%	99.7%	99.8%
Medical Facilities	97.6% - 99.9%	0.1% - 2.0%	0.0% - <0.1%	0.0%	0.0%	97.5% - 99.8%	99.8% - 99.9%	99.9%	99.9%
Police Stations	92.6% - 99.2%	0.6% - 5.3%	0.1% - 2.0%	<0.1% - 0.2%	0.0% - <0.1%	92.5% - 99.1%	97.6% - 99.8%	99.6% - 99.9%	99.8% - 99.9%





		Percent Prob	ability of Susta	ining Damage		Percent Functionality			
Name	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Fire Stations/EMS	92.4% - 99.2%	0.6% - 5.4%	0.1% - 2.0%	<0.1% - 0.3%	0.0% - <0.1%	92.4% - 99.1%	97.5% - 99.8%	99.6% - 99.9%	99.8% - 99.9%
Schools	92.4% - 99.6%	0.4% - 5.4%	<0.1% - 2.0%	0.0% - 0.3%	0.0% - <0.1%	92.4% - 99.5%	97.5% - 99.8%	99.6% - 99.9%	99.8% - 99.9%
Transportation									
Highway Bridges		0.9% - 1.0%	0.0%	0.0%	0.0%	99.9% - 100.0 %	99.9% - 100.0 %	99.9% - 100.0 %	99.9% - 100.0 %

Source: Hazus v5.1; Monroe County GIS - 2022

Notes: No results were available for Military, Utilities, Airports, or Bus Facilities.

C City

T Town

V Village

Impact on Economy

Earthquakes also impact the economy, including loss of business function, damage to inventory (buildings, transportation, and utility systems), relocation costs, wage loss, and rental loss due to repair and replacement of buildings. Hazus estimates building-related economic losses, including income losses (wage, rental, relocation, and capital-related losses) and capital stock losses (structural, non-structural, content, and inventory losses). Economic losses estimated by Hazus are summarized in Table 5.4.3-21.

Table 5.4.3-21. Building-Related Economic Losses from 100- and 500-Year MRP Earthquake Events

Mean Return Period (MRP)	Inventory Loss	Relocation Loss	Building and Content Losses	Wages Losses	Rental Losses	Capital- Related Loss
100-Year MRP	\$6,500	\$424,500	\$5,125,800	\$185,400	\$279,500	\$100,000
500-year MRP	\$1,040,100	\$17,075,700	\$267,381,100	\$5,710,500	\$9,096,400	\$3,256,600

Source: NYS GIS n.d.; Hazus v4.2

Although the Hazus analysis did not compute damage estimates for individual roadway segments and railroad tracks, assumedly these features would undergo damage due to ground failure resulting in interruptions of regional transportation and of distribution of materials. Losses to the community that would result from damage to lifelines could exceed costs of repair (FEMA 2012). Earthquake events can significantly affect road bridges, many of which provide the only access to certain neighborhoods. Because softer soils generally follow floodplain boundaries, bridges that cross watercourses should be considered vulnerable. Another key factor in degree of vulnerability is age of facilities and infrastructure, which correlates with standards in place at time of construction.

Additionally, Hazus estimates volume of debris that may be generated as a result of an earthquake event to enable the study region to prepare for and rapidly and efficiently manage debris removal and disposal. Debris estimates were divided into two categories: (1) reinforced concrete and steel that require special equipment to break up before transport can occur, and (2) brick, wood, and other debris that can be loaded directly onto trucks by use of bulldozers (Hazus Earthquake User's Manual).

For the 100-year MRP event, Hazus estimates over 18,000 tons of brick and wood debris and approximately 660 tons of concrete and steel debris will be generated. For the 500-year MRP event, Hazus v5.1 estimates 44,761 tons of brick and wood debris and 30,185 tons of concrete and steel debris will be generated.





Table 5.4.3-22. Estimated Debris Generated by the 100- and 500-Year MRP Earthquake Events

	100)-Year	500-	Year
Municipality	Brick/Wood (tons)	Concrete/Steel (tons)	Brick/Wood (tons)	Concrete/Steel (tons)
Brighton (T)	1	0	1,686	369
Brockport (V)	0	0	237	32
Chili (T)	2	0	775	156
Churchville (V)	0	0	104	25
Clarkson (T)	0	0	78	29
East Rochester (T/V)	14	4	836	515
Fairport (V)	0	0	116	16
Gates (T)	1	0	1,845	329
Greece (T)	121	16	3,832	851
Hamlin (T)	0	0	97	36
Henrietta (T)	0	0	3,294	831
Hilton (V)	0	0	174	67
Honeoye Falls (V)	0	0	440	143
Irondequoit (T)	85	14	1,474	746
Mendon (T)	0	0	124	36
Ogden (T)	0	0	310	47
Parma (T)	0	0	125	42
Penfield (T)	14	1	809	169
Perinton (T)	0	0	698	118
Pittsford (T)	0	0	618	85
Pittsford (V)	0	0	29	4
Riga (T)	0	0	221	53
Rochester (C)	1,571	624	24,085	25,033
Rush (T)	0	0	68	12
Scottsville (V)	0	0	109	20
Spencerport (V)	0	0	128	21
Sweden (T)	0	0	180	24
Webster (T)	0	0	1,699	289
Webster (V)	0	0	376	51
Wheatland (T)	0	0	195	36
Monroe County (Total)	1,808	659	44,761	30,185

С Notes: City

Т Town V

Village

Impact on the Environment

According to USGS, earthquakes can cause damage to the surface of the Earth in various forms depending on the magnitude and distribution of the event (USGS 2020). Surface faulting is one of the major seismic components to earthquakes that can create wide ruptures in the ground. Ruptures can have a direct impact on the





landscape and natural environment because it can disconnect habitats for miles isolating animal species or tear apart plant roots.

Furthermore, ground failure as a result of soil liquefaction can have an impact on soil pores and retention of water resources (USGS 2020). The greater the seismic activity and liquefaction properties of the soil, the more likely drainage of groundwater can occur which depletes groundwater resources. In areas where there is higher pressure of groundwater retention, the pores can build up more pressure and make soil behave more like a fluid rather than a solid increasing risk of localized flooding and deposition or accumulation of silt.

Cascading Impacts On Other Hazards

The Global Geoengineering Research Group in USGS has been investigating the relationship earthquakes have with ground failure, and coastal erosion (USGS n.d.). As mentioned in earlier sections, soft and loose soils are more susceptible to earthquake events. Ground failure can become exacerbated due to earthquake events, causing land sliding and coastal erosion. Areas of steep slopes are at greater risk of ground failure and potential erosion during earthquakes (USGS n.d.). Further, residual impacts from earthquakes could alter the floodplain extent for the County if ground failure and erosion occur.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. It is anticipated that the human exposure and vulnerability to earthquake impacts in newly developed areas will be similar to those that currently exist within the County. Current building codes require seismic provisions that should render new construction less vulnerable to seismic impacts than older, existing construction that may have been built using lower construction standards.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of population can impact the number of persons exposed to earthquake. Furthermore, County visitors and tourists will continue to drive potential growth in the County's communities and their amenities, exposing more persons to earthquake. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

Providing projections of future climate change for a specific region is challenging. Shorter-term projections are more closely tied to existing trends making longer-term projections even more challenging. The further out a prediction reaches, the more subject to changing dynamics it becomes. The potential impacts of global climate change on earthquake probability are unknown. Some scientists feel that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth's crust. As newly





freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska might be opening the way for future earthquakes.

Secondary impacts of earthquakes could be magnified by future climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity because of increased saturation. Dams storing increased volumes of water from changes in the climate could fail during seismic events. There are currently no models available to estimate these impacts.

Change of Vulnerability Since 2017 HMP

Overall, the County's vulnerability to the earthquake hazard has remained the same since 2017. Since the 2017 HMP analysis, population statistics have been updated using the 2020 US Census. An updated general building stock was also established. Exposure to the earthquake hazard was determined by overlaying critical facilities and building centroids on New York State NEHRP soil layer.

Overall, this vulnerability assessment uses a more precise and thorough approach, which provides increased accuracy for estimated exposure and potential losses for Monroe County.





5.4.4 Extreme Temperatures

This section provides a profile and vulnerability assessment of the extreme temperatures hazard for Monroe County.

5.4.4.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections, and the probability of future occurrences for the extreme temperatures hazard.

Description

Extreme temperature includes both heat and cold events, which can have a significant impact to human health, commercial/agricultural businesses, and primary and secondary effects on infrastructure (such as burst pipes and power failure). What constitutes "extreme cold" or "extreme heat" can vary across different areas of the country, based on the population's experience.

Extreme Cold

Extreme cold events occur when temperatures drop well below normal in an area. For example, near-freezing temperatures are considered "extreme cold" in regions relatively unaccustomed to winter weather. Conversely, "extreme cold" might be used to describe temperatures below 0° F in regions that are subjected to temperatures below freezing on more of a regular basis. For the purposes of this HMP, extreme cold temperatures are characterized when the ambient air temperature drops to approximately 0 degrees Fahrenheit (°F) or below (National Weather Service n.d.). Extensive exposure to extreme cold temperatures can cause frostbite or hypothermia and can become life-threatening. Extreme cold also can cause emergencies in susceptible populations, such as those without shelter, those who are stranded, or those who live in a home that is poorly insulated or without heat (such as mobile homes). Infants and the elderly are most susceptible to the effects of extreme changes in temperatures and are particularly at risk, but anyone can be affected (Center for Disease Control and Prevention [CDC] 2012).

In New York State, extreme cold days are defined to reflect the State's regional climate variations. Extreme cold days in the State are individual days with minimum temperatures at or below 32° F or individual days with minimum temperatures at or below 0°F (NYSERDA 2014).

Several health hazards are related to extreme cold temperatures and include wind chill, frostbite, and hypothermia.

- *Wind chill* is not the actual temperature but rather how wind and cold feel on exposed skin. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature.
- *Frostbite* is damage to body tissue caused by extreme cold. A wind chill of -20°F will cause frostbite in just 30 minutes. Frostbite can cause a loss of feeling and a white or pale appearance in extremities.
- *Hypothermia* is a condition brought on when the body temperature drops to less than 95°F, and it can be deadly. Warning signs of hypothermia include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion

Extreme Heat

Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for a region and that last for several weeks (Center for Disease Control and Prevention [CDC] 2012). Humid or muggy conditions occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. A





heat wave is a period of abnormally and uncomfortably hot and unusually humid weather. A heat wave will typically last two or more days (NOAA 2009).

In New York State, high temperatures and heat waves are defined in several ways to reflect the diversity of conditions experienced across the State. Extreme hot days in New York State are defined as individual days with maximum temperatures at or above 90° F or 95°F. Heat waves are defined as three consecutive days with maximum temperatures above 90° F (NYSERDA 2014).

Depending on severity, duration, and location; extreme heat events can create or provoke secondary hazards including, but not limited to, dust storms, droughts, wildfires, water shortages, and power outages. These secondary hazards could result in a broad and far-reaching set of impacts throughout a local area or an entire region. Impacts could include significant loss of life and illness; economic costs in transportation, agriculture, production, energy, and infrastructure; and losses of ecosystems, wildlife habitats, and water resources (NYS DHSES 2019).

Extreme heat is the number one weather-related cause of death in the U.S. On average, nearly 150 people die each year in the United States from excessive heat (NWS 2021). Figure 5.4.4-1 shows the number of weather fatalities based on a 10-year average and a 30-year average. Heat caused the highest average of weather-related fatalities between 2012 and 2021.

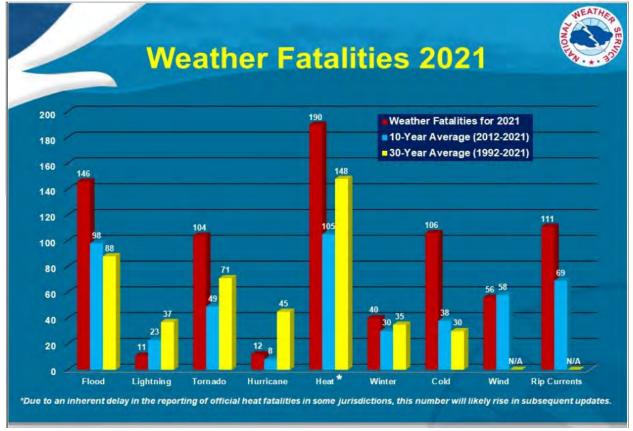


Figure 5.4.4-1. Average Number of Weather-Related Fatalities in the U.S.

Source: NWS 2021





Extent

Extreme Cold

The extent (severity or magnitude) of extreme cold temperatures is generally measured through the Wind Chill Temperature (WCT) Index. The index uses advances in science, technology, and computer modeling to provide an accurate, understandable, and useful formula for calculating the dangers from wind chill. For details regarding the WCT, refer to: <u>Winter (weather.gov)</u>. The WCT is presented in Figure 5.4.4-2.

									Tem	pera	ture	(°F)							
	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
h)	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
(hqm)	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
pu	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
Wind	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98
					Frostb	ite Tir	nes	3	0 minut	tes	1	0 minut	es [5 m	inutes				
			w	ind (Chill		= 35. ere,T=					75(V			2751	r(V ^{0.}		ective 1	

Figure 5.4.4-2. Wind Chill Index

Source: NWS 2001

Extreme Heat

The extent of extreme heat temperatures is generally measured through the Heat Index, identified in Figure 5.4.4-3. Created by the NWS, the Heat Index is a chart that accurately measures apparent temperature of the air as it increases with the relative humidity. The temperature and relative humidity are needed to determine the Heat Index. Once both values have been identified, the Heat Index is the corresponding number of both values (as seen in Figure 5.4.4-3). This index provides a measure of how temperatures actually feel; however, the values are devised for shady, light wind conditions. Figure 5.4.4-3 shows the heat index value for shaded areas. Exposure to full sun can increase the index by up to 15 degrees (NYSDHSES n.d.).





	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135							-	
90	86	91	98	105	113	122	131								n	AR
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										J
			lihood		at Dis	orders	s with Cautio	Prolo	nged E	_	u re or Danger		_	2.9	Dange	er

Figure 5.4.4-3. NWS Heat Index Chart - Shaded Areas

Table 5.4.4-1 describes the adverse effects of prolonged exposure to direct sunlight on an individual.

Table 5.4.4-1. Adverse H	Effects of Prolonged	Exposure to D	irect Sunlight
Table J.T.T-1. Auverse I	Lifects of Frontingen	LAPUSUIC TO D	in cet Sunngne

Category	Heat Index	Effects on the Body
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°F - 103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°F - 124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F or higher	Heat stroke highly likely

Source: NWS

The National Weather Service (NWS) provides alerts when Heat Indices approach hazardous levels. Table 5.4.4-2 explains these alerts. In the event of an extreme heat advisory, the NWS does the following:

- Includes Heat Index values and city forecasts
- Issues special weather statements including who is most at risk, safety rules for reducing risk, and the extent of the hazard and Heat Index values





• Provides assistance to state and local health officials in preparing Civil Emergency Messages in severe heat waves (NYSDHSES n.d.).

Alert	Criteria
Heat Advisory	Issued 12 hours of the onset of the following conditions: maximum daytime heat index values are to reach between 100°F to 104°F for at least 2 consecutive hours
Excessive Heat Watch	Issued when conditions are favorable for excessive heat in the next 24 to 72 hours
Excessive Heat Warning	Issued within 12 hours of the onset of the following conditions: maximum heat index temperature is expected to be 105°F or higher for at least 2 days and nighttime air temperatures will not drop below 75°F

Table 5.4.4-2. National Weather Service Alerts

Source: NYSDHSES n.d.

Urbanized areas and urbanization create an exacerbated type of risk during an extreme heat event, compared to rural and suburban areas. As these urban areas develop and change, so does the landscape. Buildings, roads, and other infrastructure replace open land and vegetation. Surfaces that were once permeable and moist are now impermeable and dry. These changes cause urban areas to become warmer than the surrounding areas. This forms an 'island' of higher temperatures (EPA 2022). The City of Rochester is the main urban area within Monroe County.

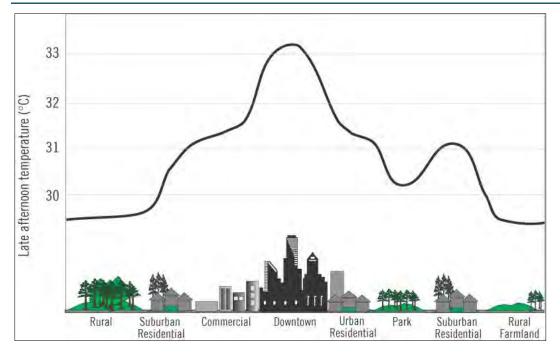
The term 'heat island' describes built-up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with more than 1 million people can be between 1.8 °F and 5.4°F warmer than its surrounding areas. In the evening, the difference in air temperatures can be as high as 22°F. Heat islands occur on the surface and in the atmosphere. On a hot, sunny day, the sun can heat dry, exposed urban surfaces to temperatures 50°F to 90°F hotter than the air. Heat islands can affect communities by increasing peak energy demand during the summer; thereby escalating air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and death, and water quality degradation (EPA 2022).

Figure 5.4.4-4 below illustrates an urban heat island profile. The graphic demonstrates that heat islands are typically most intense over dense urban areas. Further, vegetation and parks within a downtown area may help reduce heat islands (U.S. EPA 2019).









Source: EPA 2019 °C degrees Celsius

Location

Varying land elevations, character of the landscape, and proximity to large bodies of water play a significant role in the state's temperatures. Monroe County is susceptible to both extreme cold and extreme heat temperature events. Figure 5.4.4-5 shows the average low and high temperatures each month at the Rochester International Airport station located in Monroe County.

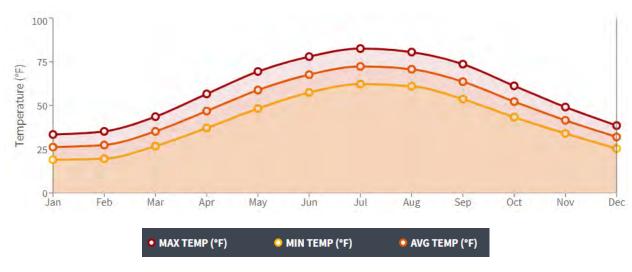


Figure 5.4.4-5. Average Temperatures at Rochester International Airport

Source: NOAA NCEI 2020





Extensive periods of extreme cold temperatures are a result from movement of great high-pressure systems into and through the eastern United States. Under higher-than-normal atmospheric pressures when arctic air masses are present, extreme winter temperatures hover over New York. New York State's location in the northeast makes it highly susceptible to extreme cold that can cause impact to human life and property (NYS DHSES 2019). Extreme cold temperatures occur throughout most of the winter season and generally accompany most winter storm events throughout the state. The NYSC Office of Cornell University indicates that cold temperatures prevail over the state whenever arctic air masses, under high barometric pressure, flow southward from central Canada or from Hudson Bay (Cornell University n.d.).

Excessive heat can occur anywhere, and occurrences of excessive heat are generally widespread and will cover an entire county. However, there can be spot locations that are somewhat cooler (e.g., a shady park near a stream) or hotter (e.g., urban areas because of their built environment holds the heat) (NYS DHSES 2019). Extreme heat temperatures of varying degrees exist throughout the state for most of the summer season, except for areas with high altitudes (Cornell University n.d.).

New York State is divided into 10 climate divisions: Western Plateau, Eastern Plateau (Catskill Mountains), Northern Plateau (Adirondack Mountains), Coastal, Hudson Valley, Mohawk Valley, Champlain Valley, St. Lawrence Valley, Great Lakes, and Central Lakes. According to NCDC, "Climatic divisions are regions within each state that have been determined to be reasonably climatically homogeneous" (NOAA 2012). Monroe County is located within the Great Lakes Division (Division 9). Figure 5.4.4-6 depicts the climate divisions in New York State.









Source: NOAA 2012

Notes: (1) Western Plateau; (2) Eastern Plateau (Catskill Mountains); (3) Northern Plateau (Adirondack Mountains); (4) Coastal; (5) Hudson Valley; (6) Mohawk Valley; (7) Champlain Valley; (8) St. Lawrence Valley; (9) Great Lakes; and (10) Central Lakes

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with extreme temperatures throughout New York State and Monroe County. With so many sources reviewed for this HMP, loss and impact information for many events could vary. Therefore, the accuracy of monetary figures discussed is based only on the available information in cited sources.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State and Monroe County were not included in any FEMA-declared extreme temperature specific disasters (DR) or emergency declarations (EM). However, Monroe County has been included in numerous declarations that involved severe winter storms. Refer to Section 5.4.10 (Severe Winter Storm) for more information on these declarations.

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties





that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that included or may have included losses due to extreme temperatures:

- S4023 2015 Heat, Excessive Heat
- S4031 2015 Heat Excessive Heat
- S4037 2015 Heat, Excessive Heat
- S4052 2015 Frost, Freeze
- S4903 2020 Frost, Freeze
- S4904 2020 Frost, Freeze

The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are low the following years as well. USDA records indicate that Monroe County has experienced crop losses from extreme temperature events. Table 5.4.4-3. provides details regarding crop losses in Monroe County according to USDA records.

Table 5.4.4-3. USDA Crop Losses from Excess Moisture/Precipitation/Rain and/or Flooding in MonroeCounty (2015-2022)

Year	Сгор Туре	Cause of Loss	Losses
2020	Sweet Corn, Green Peas, Soybean	Heat	\$98k
2020	Apples, Soybeans	Frost/Freeze	\$180k

Source: USDA 2022

Note: Cold Wet Weather is not included in the values above.

Previous Events

Table 5.4.4-4. identifies the known extreme temperature events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix E (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.4-4. Extreme Temperature Events in Monroe County, 2015 to 2022

Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
October 17, 2018	Frost/Freeze	Monroe County	N/A	N/A	Widespread freezing temperatures occurred in most of the area to start the day. This resulted in a killing freeze or end of the growing season in most counties. This included 31° F in Spencerport.
January 1–31, 2019	Extreme Cold/Wind Chill	Monroe County	N/A	N/A	Behind the front that caused widespread blowing and drifting snow across the area with localized blizzard conditions in Buffalo and Watertown, temperatures dipped below zero in the entirety of the area. This combined with wind gusts of 35 to 50 mph dropped wind chills substantially below zero. One homeless man died of exposure in Williamsville during the cold outbreak that closed almost all area schools and churches. Some of the recorded lowest wind chills during the period were, -25° F in Irondequoit,.
May 5, 2020	Frost/Freeze	Monroe County	N/A	N/A	A very cold pattern persisted from April into the growing season across most of the northeastern United States. This allowed for widespread accumulating snows periodically along with unseasonable cold temperatures to persist through the first half of May. Widespread freezing temperatures were present overnight in much of the area on several nights as the first few weeks of the growing season started. Selected morning low temperatures included 29° F in Rochester
May 8–14, 2020	Frost/Freeze	Monroe County	N/A	N/A	A very cold pattern persisted from April into the growing season across most of the northeastern United States. This allowed for widespread accumulating snows periodically along with unseasonable cold temperatures to persist through the first half of May. Widespread freezing temperatures were present overnight in much of the area on several nights as the first few weeks of the growing season started.

Source: NOAA NCEI 2022; FEMA 2022





Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and heavier precipitation are already being felt in the state. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision makers with information on the state's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2014).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change, Monroe County is part of Region 1 (Western New York and the Great Lakes Plain). In Region 1, it is estimated that temperatures will increase by 4.3°F to 6.3°F by the 2050s and 5.7°F to 9.6°F by the 2080s (baseline of 47.7°F). Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s with an average rate of warming over the past century of 0.25° F per decade. By the end of the century, the greatest warming is projected to be in the northern section of the State.

Extreme events are also projected to increase, as illustrated in Table 5.4.4-5 below (NYSERDA 2014).

Event Type (2020s)	Low Estimate (10 th Percentile)	Middle Range (25th to 75th Percentile)	High Estimate (90 th Percentile)
Days over 90 °F (8 days)	12	14 to 17	19
# Of Heat Waves (0.7 heat waves)	2	2 to 2	2
Duration of Heat Wave (4 days)	4	4 to 4	4
Days below 32 °F (133 days)	99	103 to 111	116
Days over 1" Rainfall (5 days)	4	5 to 5	6
Days over 2" Rainfall (0.6 days)	0.6	0.6 to 0.7	0.8

Table 5.4.4-5. Extreme Event Projections for Region 1

Source: NYSERDA 2014

Probability of Future Occurrences

Based on the historic and more recent extreme temperature events in Monroe County, and the future climate projections for this region, the County has a moderate probability of future extreme temperature events. It is anticipated that Monroe County will continue to experience direct and indirect impacts of extreme temperature events annually that may induce secondary hazards such as infrastructure deterioration or failure, utility failures, power outages, etc. Additionally, climate change is expected to increase the severity and frequency of extreme heat events in Monroe County. According to available record-keeping, Monroe County has a 100-percent annual chance of occurrence of extreme temperature events (heat or cold) in any given year.

Table 5.4.4-6. Probability of Future Occurrence of Extreme Temperature Events

Hazard Type	Number of Occurrences Between 1900 and 2022	% chance of occurrence in any given year
Extreme Heat (days with maximum temperature $\ge 95^{\circ}$ F or greater)	98	76.6%
Extreme Cold (days with minimum temperatures $\leq 0^{\circ}$ F	506	100%
TOTAL	604	100%

Source: Midwestern Regional Climate Center 2022; FEMA 2022

Note: Disaster occurrences include federally declared disasters and selected extreme temperature events between January 1, 1996, and January 1, 2022. Due to limitations in data, not all extreme temperature events occurring between 1996 and June 2022 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is underestimated.





Section 5.3 ranks the identified hazards of concern for Monroe County. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, the probability of occurrence of extreme temperature in the County is considered 'occasional' (between 10 and 100 percent annual probability of a hazard event occurring, as presented in Table 5.3-2.).

5.4.4.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the hazard area identified. The entire County has been identified as exposed for the extreme temperature events. Therefore, all assets in the County (population, structures, critical facilities, and lifelines), as described in the County Profile (Section 4), are exposed and potentially vulnerable. The following text evaluates and estimates the potential impact of extreme temperatures on Monroe County, including:

- Impact on Life, Health, and Safety
- Impact on General Building Stock
- Impact on Critical Facilities
- Impact on Economy
- Impact on the Environment
- Cascading Impacts on Other Hazards
- Future Changes That May Impact Vulnerability
- Change of Vulnerability Since the 2017 HMP

Impact on Life, Health and Safety

Extreme temperature events have potential health impacts including injury and death. According to the Centers for Disease Control and Prevention, populations most at risk to extreme cold and heat events include the following: (1) the elderly, who are less able to withstand temperatures extremes because of their age, health conditions, and limited mobility to access shelters; (2) infants and children up to 4 years of age; (3) individuals who are physically ill (such as with heart disease or high blood pressure), (4) low-income persons who cannot afford proper heating and cooling; and (5) members of the general public who may overexert

According to NOAA's 2001 Winter Storms The Deceptive Killers, approximately 50 percent of the deaths related to extreme cold temperatures happen to people over 60 years old, more than 75 percent of those deaths are male, and about 20 percent occur in the home (NYS DHSES 2014).

during work or exercise during extreme heat events or experience hypothermia during extreme cold events (CDC 2006).

The entire population of Monroe County is exposed to extreme temperature events. According to the 2020 U.S. Census, the County had a population of 753,109. Refer to Section 4 (County Profile) for a summary of population statistics for the county.

Impact on General Building Stock

Extreme heat generally does not affect buildings; however, losses may be associated with overheating of heating, ventilation, and air conditioning (HVAC) systems. Extreme cold temperature events can damage buildings through freezing and bursting pipes and freeze/thaw cycles. Additionally, manufactured homes (mobile homes) and antiquated or poorly constructed facilities may have inadequate capabilities to withstand extreme temperatures.





All of the building stock in the County is exposed to the extreme temperature hazard; however, direct impacts are expected to be minimal. Refer to Section 4 (County Profile), which summarizes the building inventory in Monroe County.

Impact on Critical Facilities

Similar to the general building stock, all critical facilities in the County are exposed to the extreme temperature hazard; however, direct impacts are expected to be minimal. Impacts to critical facilities are the same as were described for general building stock. Additionally, it is essential that critical facilities remain operational during natural hazard events. Extreme heat events can sometimes cause short periods of utility failures, commonly referred to as "brown-outs," created by increased usage from air conditioners, appliances, and similar equipment. Similarly, heavy snowfall and ice storms, associated with extreme cold temperature events, can interrupt power as well. Backup power is recommended for critical facilities and infrastructure.

Impact on Economy

Extreme temperature events also have impacts on the economy, including loss of business function and damage and loss of inventory. Business owners may be faced with increased financial burdens due to unexpected repairs caused to the building (pipes bursting), higher than normal utility bills, or business interruption caused by power failure (loss of electricity and telecommunications).

The agricultural industry is most at risk in terms of economic impact and damage caused by extreme temperature events. Extreme heat events can result in drought and dry conditions and directly affect livestock and crop production.

Based on the 2017 Census of Agriculture, 527 farms were present in Monroe County, encompassing 106,778 acres of total farmland. The average farm size was 203 acres. Monroe County farms had a total market value of products sold of \$76.64 million, averaging \$145,433 per farm (USDA 2017). Table 5.4.4-7 lists the acreage of agricultural land exposed to extreme temperature hazards.

Number of Farms	Land in Farms (acres)	Total Cropland (acres)	Total Pastureland (acres)	Acres Irrigated
527	106,778	85,422	4,271	639

Table 5.4.4-7. Agricultural Land in Monroe County in 2017

Source: USDA 2017

In 2017, the top three agricultural products sold in Monroe County were grains, oilseeds, dry beans, and dry peas at \$26 million; vegetables, melons, potatoes, and sweet potatoes at \$19.7 million; and nursery, greenhouse, floriculture, and sod at \$11.9 million. Monroe County was the eighth highest-ranked County in the State for its sales of cut Christmas trees and short rotation woody crops, and sixth highest ranked for its total acreage of crop items for all harvested vegetables (USDA 2017).

If an extreme temperature event impacted 40 percent of the agricultural products sold from Monroe County farms, based on 2017 market values, this would be a loss of \$30.6 million. This figure does not include how the tourism industry and local jobs are impacted.

Impact on the Environment

Extreme temperature events can have a major impact on the environment. For example, freezing and warming weather patterns create changes in natural processes. An excess amount of snowfall and earlier warming periods may affect natural processes such as flow within water resources (USGS 2020). Extreme heat events can have





particularly negative impacts on aquatic systems, contributing to fish kills, aquatic plant die offs, and increased likelihood of harmful algal blooms.

Cascading Impacts On Other Hazards

Extreme heat temperature events can exacerbate the drought hazard, increase the potential risk of wildfires, and escalate severe storm and severe winter weather events for the County. For example, extreme heat events may accelerate evaporation rates, drying out the air and soils. Extreme heat can also dry out terrestrial species, making them more susceptible to catching fire. Extreme variation in temperatures could create ideal atmospheric conditions for severe storms or worsen the outcome of severe winter weather during freezing and thawing periods. Refer to Section 5.4.9 (Severe Storm), Section 5.4.10 (Severe Winter Storm), and Section 5.4.11 (Wildfire) for more information about these hazards of concern.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in the population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

The ability of new development to withstand extreme temperature impacts can be enhanced through land use practices and consistent enforcement of codes and regulations for new construction. New development will change the landscape where buildings, roads, and other infrastructure potentially replace open land and vegetation. Transformation of pervious surfaces (including vegetation) to impervious surfaces causes an island of higher temperatures. Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). An increase in the population throughout Monroe County will increase the County's risk to extreme temperature events. Refer to section 4 (County Profile), which includes a more thorough discussion about population trends for the County.

Climate Change

As discussed above, most studies project that the State of New York will see an increase in average annual temperatures and precipitation. As the climate warms, extreme cold events might decrease in frequency, while extreme heat events might increase in frequency; the shift in temperatures could also result in hotter extreme heat events. With increased temperatures, vulnerable populations could face increased vulnerability to extreme heat and its associated illnesses, such as heatstroke and cardiovascular and kidney disease. Additionally, as temperatures rise, more buildings, facilities, and infrastructure systems may exceed their ability to cope with the heat.





Change of Vulnerability Since 2017 HMP

Overall, the entire County remains vulnerable to extreme temperatures. As existing development and infrastructure continue to age, they can be at increased risk to failed utility systems (e.g., HVAC) if they are not properly maintained. Similarly, an increase in the elderly population remaining in the County increases the vulnerable population.





5.4.5 Flood

The following section and vulnerability assessment of the flood hazard for Monroe County.

5.4.5.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the flood hazard.

Hazard Description

Floods are one of the most common natural hazards in the U.S. They can develop slowly over a period of days or develop quickly, with disastrous effects that can be local (impacting a neighborhood or community) or regional (affecting entire river basins, coastlines and multiple counties or states) (FEMA 2007). As defined in the NYS HMP (NYS DHSES 2019), flooding is a general and temporary condition of partial or complete inundation on normally dry land as a result of the following:

- Riverine overbank flooding
- Flash floods
- Alluvial fan floods
- Mudflows or debris floods
- Dam-break floods
- Local draining or high groundwater levels
- Fluctuating lake levels
- Ice-jams
- Coastal flooding
- Urban flooding

For the purpose of this HMP and as deemed appropriate by the Monroe County Steering Committee, the main flood types of concern discussed in this section include: riverine, flash, stormwater/urban, lakeshore, ice jam, and dam failure flooding. In addition, coastal erosion is considered as a cascading hazard in the coastal areas. These types of floods are further discussed below.

Riverine Flooding

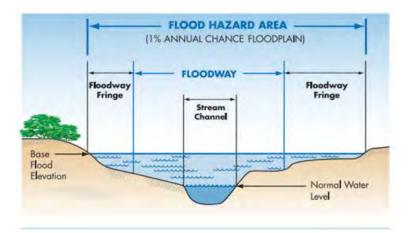
Riverine floods are the most common flood type. They occur along a channel and include overbank and flash flooding. Channels are defined, ground features that carry water through and out of a watershed. They may be called rivers, creeks, streams, or ditches. When a channel receives too much water, the excess water flows over its banks and inundates low-lying areas (Illinois Association for Floodplain and Stormwater Management 2006)

A floodplain is defined as the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. In Monroe County, floodplains line the rivers and streams of the County and the lakeshore areas. The boundaries of the floodplains are altered as a result of changes in land use, the amount of impervious surface, placement of obstructing structures in floodways, changes in precipitation and runoff patterns, improvements in technology for measuring topographic features, and utilization of different hydrologic modeling techniques. Figure 5.4.5-1 depicts the flood hazard area, the flood fringe, and the floodway areas of a floodplain.





Figure 5.4.5-1. Illustration of a Floodplain



Source: NJDEP 2015

Flash Flooding

Flash floods are defined by the National Weather Service as "a flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through riverbeds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur even if no rain has fallen, for instance after a levee or dam has failed, or after a sudden release of water by a debris or ice jam." (National Weather Service 2009).

Stormwater/Urban Flooding

Stormwater/urban flooding described below is due to local drainage issues and high groundwater levels. Locally, heavy precipitation may produce flooding in areas other than delineated floodplains or along recognizable channels. If local conditions cannot accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding problems. During winter and spring, frozen ground and snow accumulations may contribute to inadequate drainage and localized ponding. Flooding issues of this nature generally occur in areas with flat gradients and generally increase with urbanization which speeds the accumulation of floodwaters because of impervious areas. Shallow street flooding can occur unless channels have been improved to account for increased flows (FEMA 1997).

High groundwater levels can be a concern and cause problems even where there is no surface flooding. Basements are susceptible to high groundwater levels. Seasonally high groundwater is common in many areas, while elsewhere high groundwater occurs only after a long period of above-average precipitation (FEMA 1997).

Heavy rainfall that overwhelms a developed area's stormwater infrastructure causing flooding is commonly referred to as urban flooding. Urban flooding can be worsened by aging and inadequate infrastructure and over development of land. The growing number of extreme rainfall events that produce intense precipitation are resulting in increased urban flooding (Center for Disaster Resilience 2016). While riverine and lakeshore flooding is mapped and studied by FEMA, urban flooding is not.

NOAA defines urban flooding as the flooding of streets, underpasses, low lying areas, or storm drains (National Weather Service 2009). Urban drainage flooding is caused by increased water runoff due to urban development and inadequate drainage systems. Drainage systems are designed to remove surface water from developed areas as quickly as possible to prevent localized flooding on streets and other urban areas. The systems make use of a





closed conveyance system that channels water away from an urban area to surrounding streams. This bypasses the natural processes of water filtration through the ground, containment, and evaporation of excess water. Because drainage systems reduce the amount of time the surface water takes to reach surrounding streams, flooding in those streams can occur more quickly and reach greater depths than prior to development in that area (Harris 2008)

Coastal/Lakeshore Flooding, Seiches, and Erosion

Great Lakes storms can occur any time of the year and at varying levels of severity. Natural protective features within coastal erosion hazard areas provide buffering and protection to shorelines from erosion. Dunes and bluffs are effective against storm-induced high water and related wave action (NYS DHSES 2019).

Wind and weather conditions on the Great Lakes may create a seiche, an oscillating wave which can be several feet high. In many of the Great Lakes, the time period between the "high" and "low" of a seiche may be between 4 and 7 hours. As this is similar to the 6-hour time period of the tides on the ocean, it is frequently mistaken for a tide.

Coastal/lakeshore flooding may cause beach erosion; loss or submergence of wetlands and other coastal ecosystems; high water tables; loss of coastal recreation areas, beaches, protective sand dunes, parks, and open space; and loss of coastal structures. Coastal structures can include sea walls, piers, bulkheads, bridges, or buildings (FEMA 2011).

There are several forces that occur with coastal/lakeshore flooding:

- *Hydrostatic forces* against a structure are created by standing or slowly moving water. Flooding can cause vertical hydrostatic forces, or flotation. These types of forces are one of the main causes of flood damage.
- *Hydrodynamic forces* on buildings are created when coastal floodwaters move at high velocities. These high-velocity flows are capable of destroying solid walls and dislodging buildings with inadequate foundations. High-velocity flows can also move large quantities of sediment and debris that can cause additional damage. In lakeshore areas, high-velocity flows are typically associated with one or more of the following:
 - Wave run-up flowing landward through breaks in sand dunes or across low-lying areas
 - Strong currents parallel to the shoreline, driven by waves produced from a storm
 - High-velocity flows

High-velocity flows can be created or exacerbated by the presence of manmade or natural obstructions along the shoreline and by weak points formed by roads and access paths that cross dunes, bridges or canals, channels, or drainage features.

- *Waves* can affect coastal buildings from breaking waves, wave run-up, wave reflection and deflection, and wave uplift. The most severe damage is caused by breaking waves. The force created by these types of waves breaking against a vertical surface is often at least 10 times higher than the force created by high winds during a storm.
- *Flood-borne debris* produced by coastal flooding events and storms typically includes decks, steps, ramps, breakaway wall panels, portions of or entire houses, heating oil and propane tanks, cars, boats, decks and pilings from piers, fences, erosion control structures, and many other types of smaller objects. Debris from floods are capable of destroying unreinforced masonry walls, light wood-frame construction, and small-diameter posts and piles (FEMA 2011).





As waves approach a shoreline, they crest and break, losing some initial energy. The remaining wave runs up the beach before pulling back down. Depending on the size of the wave, angle of wave "attack," and the wave period, waves can cause erosion or accretion of sediment. Seasonal high temperatures and seiches contribute to elevated lake levels allowing larger waves to reach the shoreline. Greater water depths near shore also result in less loss of wave energy from shoaling.

Elevated lake levels contribute to higher rates of coastal erosion. Higher lake levels will magnify the reach of currents and wave action. Unlike oceans which have tides, the Great Lakes are considered to be non-tidal and experience change in water levels primarily because of meteorological effects. Water levels in the Great Lakes have long-term, annual, and short-term variations. Long-term variations depend on precipitation and water storage over many years. Annual variations occur with the changing seasons with an annual high in the late spring and a low in the winter. These changes occur at a rate that can be measured in feet per month (NOAA 2020).

Ice Jam Flooding

An ice jam occurs when pieces of floating ice are carried with a stream's current and accumulate behind any obstruction to the stream flow. Obstructions may include river bends, mouths of tributaries, points where the river slope decreases, as well as dams and bridges. The water held back by this obstruction can cause flooding upstream, and if the obstruction suddenly breaks, flash flooding can occur as well (NOAA 2013). The formation of ice jams depends on the weather and physical condition of the river and stream channels. They are most likely to occur where the channel slope naturally decreases, in culverts, and along shallows where channels may freeze solid. Ice jams and

Ice Jams At a Glance

- Freeze-up jams occur when floating ice may slow or stop due to a change in water slope as it reaches an obstruction to movement.
- Breakup jams occur during periods of thaw, generally in late winter and early spring.

resulting floods can occur during at different times of the year: fall freeze-up from the formation of frazil ice; mid-winter periods when stream channels freeze solid, forming anchor ice; and spring breakup when rising water levels from snowmelt or rainfall break existing ice cover into pieces that accumulate at bridges or other types of obstructions (NYS DHSES 2019).

Dam Failure Flooding

A dam is an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water (FEMA 2007). Dams are man-made structures built across a stream or river that impound water and reduce the flow downstream (FEMA 2003). They are built for the purpose of power production, agriculture, water supply, recreation, and flood protection. Dam failure is any malfunction or abnormality outside of the design that adversely affects a dam's primary function of impounding water (FEMA 2007). Dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam (inadequate spillway capacity due to uncontrolled release or exceedance of design);
- Prolonged periods of rainfall and flooding;
- Deliberate acts of sabotage (terrorism);
- Structural failure of materials used in dam construction;
- Movement and/or failure of the foundation supporting the dam;
- Settlement and cracking of concrete or embankment dams;
- Piping and internal erosion of soil in embankment dams;
- Inadequate or negligent operation, maintenance, and upkeep;
- Failure of upstream dams on the same waterway; or





• Earthquake (liquefaction / landslides) (FEMA 2007).

A break in a dam can produce extremely dangerous flood situations because of the high velocities and large volumes of water released by such a break. Sometimes they can occur with little to no warning. Breaching of dams often occurs within hours after the first visible sign of dam failure, leaving little or no time for evacuation (FEMA 2007).

Location

Flooding potential is influenced by climatology, meteorology, and topography (elevations, latitude, and water bodies and waterways). Flooding potential for each type of flooding that affects Monroe County is described in the subsections below.

Floodplains

A floodplain is defined as the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. In Monroe County, floodplains line the rivers, streams, and lakeshores of the County. The boundaries of the floodplains are altered as a result of changes in land use, the amount of impervious surface, placement of obstructing structures in floodways, changes in precipitation and runoff patterns, improvements in technology for measuring topographic features, and utilization of different hydrologic modeling techniques (NJAFM 2015).

Flood hazard areas are identified as Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled to or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. A 100-year floodplain is not a flood that will occur once every 100 years; the designation indicates a flood that has a 1-percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. Similarly, the moderate flood hazard area (500-year floodplain) will not occur every 500 years but is an event with a 0.2-percent chance of being equaled or exceeded each year (FEMA 2020). The 1-percent annual chance floodplain establishes the area that has flood insurance and floodplain management requirements.

Figure 5.4.5-2. Flood Map Terms

Flood Map Terms

- Flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA).
- SFHA = the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year.
- 1-percent annual chance flood = the base flood or 100-year flood.
- SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30.
- Zone B or Zone X (shaded) = Moderate flood hazard areas and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood.
- Zone C or Zone X (unshaded) = Areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled

Source: FEMA 2018

Locations of flood zones in Monroe County as depicted on the FEMA preliminary Digital Flood Insurance Rate Map (DFIRM) are illustrated in, Figure 5.4.5-3 and the total land area in the floodplain, inclusive of waterbodies,





is summarized in Table 5.4.5-1. Refer to Section 9 for a map of each jurisdiction depicting the floodplains. Flood hazard zones occur throughout the County.

Table 5.4.5-1. Number of Acres Monroe County Is Exposed to 1-Percent and 0.2-Percent Annual Chance	
Flood	

			Total Acres of Land Area (Excluding Waterbodies) Located in the Flood Hazard Areas				
Jurisdiction	Total Acres of Land Area	Total Acres Located in the 1-Percent Annual Chance Flood Event	Percent of Total	Total Acres Located in the 0.2-Percent Annual Chance Flood Event	Percent of Total		
Brighton (T)	9,868	879	8.9%	1,402	14.2%		
Brockport (V)	1,375	26	1.9%	26	1.9%		
Chili (T)	25,234	5,967	23.6%	6,681	26.5%		
Churchville (V)	743	57	7.6%	89	11.9%		
Clarkson (T)	21,170	1,114	5.3%	1,130	5.3%		
East Rochester (T/V)	837	28	3.3%	29	3.4%		
Fairport (V)	1,002	66	6.5%	71	7.1%		
Gates (T)	9,740	1,324	13.6%	1,434	14.7%		
Greece (T)	30,096	2,714	9.0%	3,001	10.0%		
Hamlin (T)	27,493	1,442	5.2%	1,443	5.2%		
Henrietta (T)	22,578	2,250	10.0%	2,856	12.6%		
Hilton (V)	1,119	78	6.9%	89	8.0%		
Honeoye Falls (V)	1,621	147	9.0%	178	11.0%		
Irondequoit (T)	9,626	204	2.1%	211	2.2%		
Mendon (T)	23,684	1,672	7.1%	2,156	9.1%		
Ogden (T)	22,551	1,164	5.2%	1,372	6.1%		
Parma (T)	25,575	1,563	6.1%	1,727	6.8%		
Penfield (T)	23,840	1,615	6.8%	2,292	9.6%		
Perinton (T)	20,874	1,335	6.4%	1,352	6.5%		
Pittsford (T)	14,399	798	5.5%	852	5.9%		
Pittsford (V)	449	5	1.2%	5	1.2%		
Riga (T)	21,706	1,204	5.5%	1,572	7.2%		
Rochester (C)	22,860	565	2.5%	681	3.0%		
Rush (T)	19,410	1,966	10.1%	2,804	14.4%		
Scottsville (V)	615	45	7.3%	80	13.0%		
Spencerport (V)	813	42	5.1%	52	6.4%		
Sweden (T)	20,200	1,145	5.7%	1,146	5.7%		
Webster (T)	20,270	1,327	6.5%	1,449	7.1%		
Webster (V)	1,392	4	0.3%	7	0.5%		
Wheatland (T)	18,892	2,124	11.2%	2,254	11.9%		
Monroe County (Total)	420,035	32,866	7.8%	38,442	9.2%		

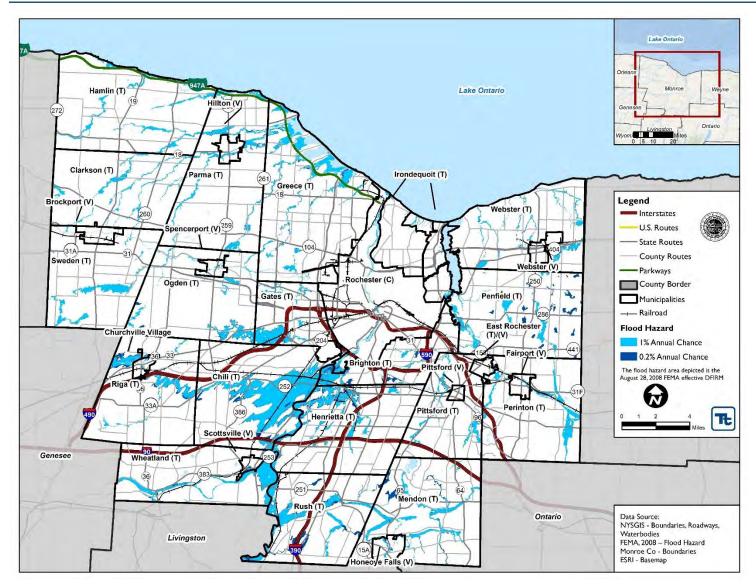
Source: FEMA 2008; Monroe County GIS 2022

Note: C = City, T = Town, V = Village, % = Percent













Flood Gages

The USGS National Water Information System (NWIS) collects surface water data from more than 850,000 stations across the country. The time-series data describes stream levels, streamflow (discharge), reservoir and lake levels, surface water quality, and rainfall. The data is collected by automatic recorders and manual field measurements at the gage locations. USGS uses stream gages to determine the severity of flood at different points along a body of water. There are numerous gages in Monroe County, in addition to others just outside of the County's boundary, that provide critical flood data for waterways affecting the County.

There are 10 stream gages in the County and 4 gages on Lake Ontario. Table 5.4.5-2 shows the stream gages in the County and details about each gage. The USGS website provides details about each of the gages (<u>https://waterwatch.usgs.gov/index.php</u>) and the gage heights of flooding events. The NWS provides the different flood stages for the gages (<u>https://water.weather.gov/ahps/</u>).

Gage Site Number	Site Name	Flood Stage Height	Record Flood Height
04220223	Sandy Creek at North Hamlin	Unavailable	14.79
0422026250	Northrup Creek at North Greece	Unavailable	5.01
04232050	Allen Creek at Rochester	5	Unavailable
04231000	Black Creek at Churchville	6	9.44
04232040	Irondequoit Creek at Railroad Mills	8	Unavailable
04232042	Irondequoit Creek at Rochester	Unavailable	Unavailable
04228500	Genesee River at Rochester	15	24.50
04232000	Genesee River at South Rochester	17	Unavailable
04229500	Honeoye Creek at Honeoye Falls	6.5	8.42
04230500	Oatka Creek at Garbutt	6	8.64

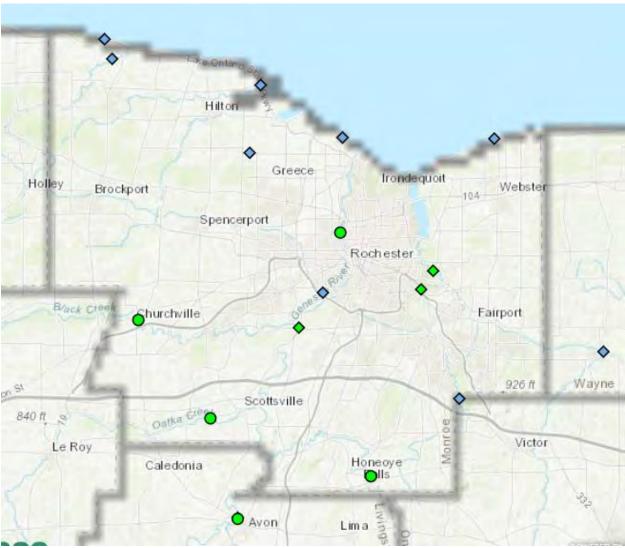
Table 5.4.5-2. Gages in Monroe County

Source: FEMA FIS 2022; NWS 2022; USGS 2022









Source: NWS 2022

Riverine Flooding

Riverine flooding is most severe around major creeks and riverbeds, including Red Creek, Black Creek, Oatka Creek, Honeoye Creek, Irondequoit Creek, Allens Creek, and the Genesee River. According to the County's FIS, major floods can occur on Irondequoit Creek and lower Genesee River any time of year, although most result from heavy rainfall or snowmelt in the basin. Flood problems along the Genesee River are most visible in low-lying areas, and high water periodically will inundate primary residences and vacation homes. Tropical Storm Agnes caused the largest flood on the lower Genesee River since the Mount Morris Dam began operations in 1951 (FEMA 2008).

Additionally, the Lower Black Creek (from Churchville to the river) is a very large and wide floodplain, and the area floods often. According to Monroe County Department of Health, this vulnerability is detailed in a USACE report from the 1950s. Smaller magnitude flooding can occur in the Red Creek basin in Henrietta and Rush; the lack of relief in many of these areas hinders drainage so that it frequently backs up when large amounts of water





hit. Ellison Park in Brighton undergoes routine flooding as well; however, that is due to its location in the floodplain.

Lastly, a spot on Irondequoit Creek, in Perinton, has been noted as problematic, and there is concern over canal maintenance operations. These maintenance operations open bottom manholes during the winter to facilitate repairs, creating additional discharges. The additional discharges, while relatively small (<20 cubic feet per second [cfs]) take up storage in stream channels that could be hit with melt off discharges (FEMA 2008).

Flash Flooding

Flash flooding can occur throughout any region of NYS; however, the distinctive flash flood event characterized by fast moving water and damaging impacts requires a steep topography. While Monroe County could undergo flash floods (and has, in the past), the County is at a lower risk than other parts of the State for this type of flood event (NYS DHSES 2019).

Stormwater/Urban Flooding

Stormwater/urban flooding is not mapped by the State or FEMA but is most likely to occur in highly developed areas with high percentages of impervious coverage that contribute to high rates of runoff. Locations that have undersized stormwater components or stormwater components that are prone to becoming clogged or failing often experience stormwater flooding.

Coastal/Lakeshore Flooding, Seiches, and Erosion

The south shore of Lake Ontario is the only major coastline in the County, and thus the County's only scene of notable lakeshore flooding. Monroe County contains 36.5 miles of Lake Ontario shoreline, which increases residential risk from erosion and wave action, threatens local infrastructure, compromises sensitive environmental features, and contributes to general flooding events. Moreover, the geography along Lake Ontario increases likelihood of training thunderstorms (i.e., thunderstorms repeatedly moving across the same area), particularly along Lake Breeze Fronts.

Water levels in the Great Lakes have long-term, annual, and short-term variations. Long-term variations depend on precipitation and water storage over many years. Annual variations occur with the changing seasons with an annual high in the late spring and a low in the winter. These changes occur at a rate that can be measured in feet per month (NOAA 2020). Most damaging floods from Lake Ontario occur when lake levels are high or during severe storms. Both scenarios create a temporary rise in the lake level and wave run-ups. Although these floods may occur throughout the year, they are most probable during spring (FEMA 2008).

Coastal Erosion Hazard Area

The coastline of Lake Monroe is designated by NYS DEC as an area at risk to coastal erosion from natural and human activities and is therefore regulated. NYS DEC has two programs focused on the protection of coastal erosion: Coastal Erosion Hazard Area (CEHA) permit program and the United States Army Corps of Engineers (USACE) Civil Works Program. The CEHA program regulates and issues permits for activities within a coastal erosion hazard area. NYS DEC works with USACE to study coastal erosion problems along coastlines and to develop coastal erosion solutions. These are usually large-scale projects that impact entire communities (NYS DEC n.d.)

Because of the consistent coastal erosion problems along the New York State coastline, the State Legislature passed the CEHA Act (Article 34 of the Environmental Conservation Law [ECL]), establishing the state's coastal policy in August 1981. Under this act:





- Areas prone to coastal erosion are identified.
- Activities in areas subject to coastal erosion are undertaken in such a way that damage to property is minimized, increases in coastal erosion are prevented, and natural features are protected. Public actions likely to encourage new development in CEHA should not be undertaken unless the areas are protected by structural or other erosion control projects, which could prevent erosion damage during the life of the proposed action.
- Erosion control projects are publicly financed only where needed to protect human life for existing or new development, which absolutely requires a location within a given hazard area.
- Public and private erosion control projects should minimize damage to other human-made property, natural protective features, and other natural resources.

Regulated CEHA communities have various actions that are restricted, prohibited, or require a permit (NYS DEC n.d.). The following municipalities are Certified CEHA communities in Monroe County:

- Town of Greece
- Town of Hamlin
- Town of Irondequoit
- Town of Parma
- Town of Penfield
- City of Rochester
- Town of Webster (NYS DEC n.d.)

NYS DEC has established a general permit (Great Lakes Erosion Control General Permit) for various shoreline stabilization and structural repair activities in state-regulated waters, wetlands, and coastal erosion hazard areas along Lake Monroe, Lake Ontario, Niagara River, and St. Lawrence River. The Great Lakes Erosion Control General Permit (GP-0-20-004) was issued on May 8, 2020 for a five-year term in response to recurring high-water events in these systems and the ongoing need for affected property owners to install shoreline stabilization measures and repair damaged property (NYS DEC n.d.).

Ice Jam Flooding

Ice jams are common in the northeast United States, and NYS is not an exception. In fact, according to USACE, NYS ranks second in the United States for total number of ice jam events, with over 1,600 incidents documented between 1867 and 2015. Areas of NYS that include characteristics lending to ice jam flooding are the northern counties of the Finger Lakes region and far western New York, the Mohawk Valley of central and eastern NYS, and the North Country (NYS DHSES 2019).

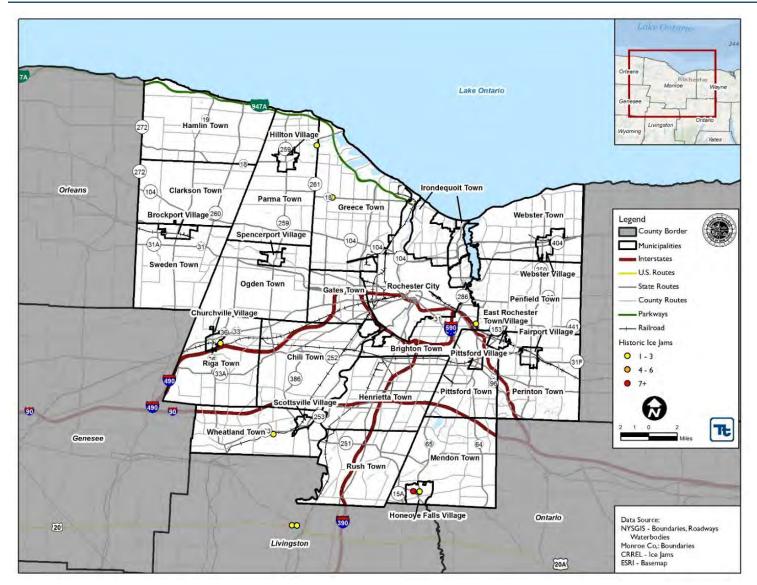
The Ice Jam Database, maintained by the Ice Engineering Group at the USACE Cold Regions Research and Engineering Laboratory (CRREL), currently consists of over 19,000 records from across the United States. According to the USACE-CRREL, Monroe County underwent or may have been impacted by 74 historic ice jam incidents between 1780 and 2022, though no events have occurred in the last 25 years (USACE 2022). Ice Jams have formed along Oatka Creek, Honeoye Creek, Genesee River, Black Creek, Crystal Brook, Canandaigua Lake Outlet, Cayuga Inlet, Fall Creek, Flint Creek, Hemlock Creek, Ninemile Creek, Onondaga Creek, Owasco Outlet, Seneca River, Northrup Creek, West Creek, Sterling Creek, and Allen Creek.

Figure 5.4.5-5 shows the number of ice jam incidents in Monroe County from 1780 to 2022. Historical events are also cited in Appendix H.













Dam Failure

Locations of the dams in Monroe County are shown in Figure 5.4.5-6. The number of dams by classification per municipality is listed in Table 5.4.5-3. Dam failure can result in flooding of areas downstream of the failed dam. According to NYS DEC data, Monroe County has 23 dams with negligible or no hazard, 43 low hazard dams, 6 intermediate hazard dams, and nine high hazard dams (NYS DEC 2022). High hazard dams are required to develop emergency action plans.

Table 5.4.5-3. Dams by Hazard Classification per Jurisdiction in Monroe County

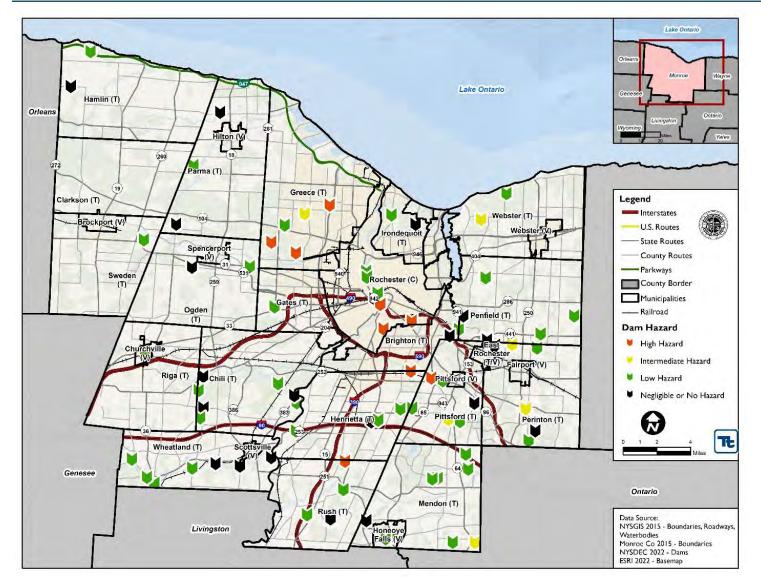
Jurisdiction	High Hazard Dams within Jurisdiction	Intermediate Hazard Dams within Jurisdiction	Low Hazard Dams within Jurisdiction	Negligible or No Hazard Dams within Jurisdiction
Brighton (T)	0	0	0	1
Brockport (V)	0	0	0	0
Chili (T)	0	0	4	3
Churchville (V)	0	0	1	0
Clarkson (T)	0	0	0	0
East Rochester (T/V)	0	0	0	0
Fairport (V)	0	0	0	0
Gates (T)	0	0	1	0
Greece (T)	3	1	1	0
Hamlin (T)	0	0	1	1
Henrietta (T)	1	0	3	1
Hilton (V)	0	0	0	0
Honeoye Falls (V)	0	0	2	0
Irondequoit (T)	0	0	1	1
Mendon (T)	0	1	5	1
Ogden (T)	0	0	1	1
Parma (T)	0	0	1	2
Penfield (T)	0	0	5	3
Perinton (T)	0	2	2	2
Pittsford (T)	1	1	3	1
Pittsford (V)	0	0	0	0
Riga (T)	0	0	0	0
Rochester (C)	3	0	3	2
Rush (T)	1	0	3	1
Scottsville (V)	0	0	0	0
Spencerport (V)	0	0	0	0
Sweden (T)	0	0	1	0
Webster (T)	0	1	1	0
Webster (V)	0	0	0	0
Wheatland (T)	0	0	4	3
Monroe County (Total) Source: NYSDEC 2022	9	6	43	23

Source: NYSDEC 2022





Figure 5.4.5-6. Dams in Monroe County







Flood Protection Structures

Monroe County has a variety of flood protection structures in place including the following dams and retention basins:

- Dams
 - Churchville Dam on Black Creek about 0.5 miles south of Village of Churchville Town of Riga border
 - Provides some retention of storm waters with 1-percent annual chance recurrence but has negligible effects with larger storms.
 - Driving Park Dam on the Genesee River about 2.3 miles south of City of Rochester Town of Irondequoit Border
 - Controlled during normal flows by the Rochester Gas and Electric Company. During flood flows, reverts from detention facilities to run-of-the river structures .
 - Central Avenue Dam on the Genesee River about 3.1 miles northeast of City of Rochester Town of Chili border
 - Controlled during normal flows by the Rochester Gas and Electric Company. During flood flows, reverts from detention facilities to run-of-the river structures
 - Court Street Dam on the Genesee River about 2.7 miles northeast of City of Rochester Town of Chili border
 - Operated by New York State. During flood flows, reverts from detention facilities to run-of-the river structures
 - Mount Morris Dam on the Genesee River about 25 miles south of the Chili Wheatland border
 - Constructed by the USACE in 1951. Since operation began, significant damages to lower Genesee River Valley were averted during floods.
 - Honeoye Creek has several dams and one dike which provides protection to the Sewage treatment plant for a 500-year flood
- Retention Basins
 - East Branch Larkin Creek: Significantly reduce downstream peak flood flows and effectively reduce the width of the floodplain
 - Round Pond Creek: Significantly reduce downstream peak flood flows and effectively reduce the width of the floodplain (FEMA 2022)

Extent

The severity of a flood event is typically determined by a combination of several factors depending on the type of flooding event.

Riverine and Flash Flooding

The severity of riverine and flash flooding is determined by a combination of several factors including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and degree of vegetative clearing and impervious surface. Generally, floods are long-term events that may last for several days. Severity depends not only on the amount of water that accumulates in a period of time, but also on the land's ability to manage this water. One element is the size of rivers and streams in an area; but an equally important factor is the land's absorbency. When it rains, soil acts as a sponge. When the land is saturated or frozen, infiltration into the ground slows and any more water that accumulates must flow as runoff (Harris 2008).

The frequency and severity of riverine flooding are measured using a discharge probability, which is the probability that a certain river discharge (flow) level will be equaled or exceeded in a given year. Flood studies use historical records to determine the probability of occurrence for the different discharge levels.





In the case of riverine or flash flooding, once a river reaches flood stage, the flood extent or severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat:

- *Minor Flooding* minimal or no property damage, but possibly some public threat or inconvenience.
- *Moderate Flooding* some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- *Major Flooding* extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations (NWS 2011).

Stormwater/ Urban Flooding

Currently, there is no measurement used to further define the frequency and severity of stormwater/urban flooding.

Coastal/Lakeshore Flooding, Seiches, and Erosion

The extent of coastal flooding due to storms is determined by three factors: 1) the nature of the storm with respect to intensity, duration, and path; 2) astronomical tide conditions at the time the seiche or storm surge wave reaches the shore; and 3) the physical geometry and bathymetry of a particular area, which affects the time and passage of the seiche or surge wave.

Coastal erosion is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time. Geologists measure the severity of erosion in two ways, as a rate of linear retreat (feet of shoreline recession per year) and volumetric loss (cubic yards of eroded sediment per linear foot of shoreline frontage per year) (NYCEM 2019).

Ice Jam

Ice jam flooding events often occur suddenly and difficult to predict, allowing for little time to prepare for and warn of an event. The size of the snowpack and the rate of snowmelt controls the extent of an ice jam (Rokaya 2018).

Dam Failure

According to the NYSDEC Division of Water Bureau of Flood Protection and Dam Safety, the hazard classification of a dam is assigned according to the potential impacts of a dam failure pursuant to 6 New York Codes, Rules, and Regulations (NYCRR) Part 673.3 (NYSDEC 2009). Dams are classified in terms of potential for downstream damage if the dam were to fail. These hazard classifications are identified and defined below:

- Low Hazard (Class A) is a dam located in an area where failure will damage nothing more than isolated buildings, undeveloped lands, or township or county roads and/or will cause no significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life. Losses are principally limited to the owner's property
- Intermediate Hazard (Class B) is a dam located in an area where failure may damage isolated homes, main highways, minor railroads, interrupt the use of relatively important public utilities, and/or will cause significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life, but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.





- *High Hazard (Class C)* is a dam located in an area where failure may cause loss of human life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads and/or will cause extensive economic loss. This is a downstream hazard classification for dams in which excessive economic loss (urban area including extensive community, industry, agriculture, or outstanding natural resources) would occur as a direct result of dam failure.
- *Negligible or No Hazard (Class D)* is (1) a dam that has been breached or removed, or has failed or otherwise no longer materially impounds waters, or (2) a dam that was planned but never constructed. Class "D" dams are considered to be defunct dams posing negligible or no hazard. The department may retain pertinent records regarding such dams (NYSDEC 2009).

Previous Occurrences and Losses

Historical information regarding previous occurrences and losses associated with flooding events throughout NYS and areas within Monroe County was obtained from many sources. Given so many sources reviewed for the purpose of this HMP, loss and impact information regarding many events could vary depending on the source.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State was included in 25 FEMA declared flood specific disasters (DR) or emergency declarations (EM). Monroe County was included in four of these flood-related declarations (Table 5.4.5-4).

FEMA Declaration Number	Date(s) Of Event	Event Type	Details
DR-338	June 23, 1972	Flood	Tropical Storm Agnes
DR-367	March 21, 1973	Flood	High Winds, Wave Action & Flooding
EM-3004	November 2, 1974	Flood	Flooding (NYS Barge Canal)
4348	May 2, 2017 – August 6, 2017	Flood	Flooding

Table 5.4.5-4. FEMA DR and EM Declarations for Flood Events in Monroe County, 1954 to 2020

Source: FEMA 2022

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that included or may have included losses due to flood events:

- S3885 2015: Excessive Rain, High Winds, Hail, Lightning, and Tornado
- S4274- 2017: Flooding (USDA 2022)

The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are low the following years as well. USDA records indicate that Monroe County has experienced crop losses from flood events in the years when USDA disasters were declared. Table 5.4.5-5 provides details regarding crop losses in Monroe County according to USDA records.





Year	Сгор Туре	Cause of Loss	Losses
2015	Wheat	Excessive Moisture/Precipitation/Rain	\$383,497
2015	Corn	Excessive Moisture/Precipitation/Rain	\$189,525
2015	Sweet Corn	Excessive Moisture/Precipitation/Rain	\$44,445
2015	Processing Beans	Excessive Moisture/Precipitation/Rain	\$17,125
2015	Dry Beans	Excessive Moisture/Precipitation/Rain	\$185,704
2015	Green Beans	Excessive Moisture/Precipitation/Rain	\$219,586
2015	Cabbage	Excessive Moisture/Precipitation/Rain	\$193,576
2015	Soybeans	Excessive Moisture/Precipitation/Rain	\$383,497
2017	Wheat	Excessive Moisture/Precipitation/Rain	\$32,855
2017	Oats	Excessive Moisture/Precipitation/Rain	\$400
2017	Corn	Excessive Moisture/Precipitation/Rain	\$2,078,194
2017	Sweet Corn	Excessive Moisture/Precipitation/Rain	\$82,456
2017	Processing Beans	Excessive Moisture/Precipitation/Rain	\$69,108
2017	Dry Beans	Excessive Moisture/Precipitation/Rain	\$148,863
2017	Green Peas	Excessive Moisture/Precipitation/Rain	\$21,267
2017	Cabbage	Excessive Moisture/Precipitation/Rain	\$291,050
2017	Soybeans	Excessive Moisture/Precipitation/Rain	\$807,200

Table 5.4.5-5. Flood Related USDA Crop Losses from in Monroe County (2015-2022)

Source: USDA 2022

Previous Events

Table 5.4.5-6 identifies the known flood events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix E (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.5-6.Flood Events in Monroe County, 2015 to 2022

Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
August 20, 2015	Flash Flood	N/A	N/A	Beechwood, Gates Center	A slow moving cold front brought heavy rain and thunderstorms to the Genesee Valley and Finger Lakes. In Monroe County, the thunderstorms produced rainfall measured at near two inches in about twenty minutes. The heavy rains overwhelmed many storm systems in the Rochester area. Numerous underpasses were flooded and some cars were inundated by water. The flood waters produced some damage at Highland Hospital in Rochester. \$35,000 in property damage was reported at Beechwood. \$100,000 in property damage was reported in Beechwood. \$35,000 in property damage was reported in Gates Center.
April 6-8, 2017	Flood	N/A	N/A	Churchville	The month of April began on a wet note following a wet March. Several areas creeks reached flood stage. Irondequoit Creek in Monroe County peaked at 9.44 feet at 9:45 AM EST on the 7th. Flooding occurred at Ellison Park and along Blossom Road with additional flooding along Allen Creek. The Black River at Watertown crested at 10.48 feet on the 8th at 11:15 AM EST. Flood stage is 10 feet. Farmland flooding was reported in the Flats with some minor flooding to riverfront properties in Dexter. Black Creek at Churchville, in Monroe County, crested at 6.76 feet on the 8th at 8:30 AM EST. Churchville reported \$20,000 in damage over the event.
May 1, 2017	Flood	N/A	N/A	Morton, Greece	A strong cold front moved across the region during the afternoon and evening hours. A line of thunderstorms just ahead of the front produced damaging winds that downed trees and wires across western New York through the Finger Lakes Region as well as areas east of Lake Ontario. A few falling trees caused minor structural damage. Wind gusts were measured to 60 mph. The line of storms also dropped heavy rainfall in a short period of time, with amounts of 0.75 to 1.5 inches common over a few hours. While not overly excessive rates, on top of very wet antecedent conditions, there were reports of road closures due to flooding mainly in flood prone areas such as low-lying land and underpasses. \$8,000 in property damage was reported in Morton.
May 6-7, 2017	Flood	N/A	N/A	Brighton, Churchville	Soaking rains fell across the region. Combined with the antecedent wet conditions (the three month March through May period was the second wettest on record in Rochester) area creeks rain high and in some cases overflowed. Black Creek at Churchville crested at 6.21 feet at 6:30 AM EST on the 7th. Irondequoit Creek crested at 8.62 feet at 8:15 PM EST on the 6th. \$10,000 in property damage was reported in Brighton. \$15,000 in property damage was reported in Churchville.
June- November, 2017	Lakeshore Flooding	DR-4348	Yes	Town of Hamlin, Town of Parma, Town of Greece, City of Rochester, Town of Irondequoit, Town of Webster,	During the first six months of 2017, more than twice the normal amount of water accumulated on Lake Ontario while the Ottawa River saw the highest flows in more than 50 years, leading to widespread flooding across the Lake Ontario St. Lawrence River system. Inflows to Lake Ontario from Lake Monroe were above average from January through June. Lake Ontario saw two of the wettest months ever recorded in April and May of 2017. Water levels were impacted by precipitation falling directly onto the lake's surface and by runoff. Variable ice conditions in the St. Lawrence River from January through March along with high Ottawa River flows limited outflow from Lake Ontario. The lake reached a record level of 248.95 feet. Flooding began in early May and continued into early fall. Waves destroyed public and private breakwalls all along the lake shore. Thousands of homes and buildings were affected flood waters. Several homes dropped off bluffs. In some areas shoreline erosion of 50 to 100 feet deep occurred. Sanitary sewer systems in lakeside communities were affected. Beaches, marinas and state parks were closed all summer long







Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
				Town of Penfield.	with unknown economic losses to mainly seasonal businesses. In late May, the Governor imposed a 5 mph speed limit within 600 feet of the Lake Ontario and St. Lawrence River shore. The shoreline counties of Lake Ontario and the St. Lawrence River sustained enough damage to qualify for both a New York State and Federal Disaster Declaration. By summer's end, damage estimates included \$3 Million in Monroe County.
November 6-8, 2017	Flood	N/A	N/A	Mumford, Scottsville, Churchville	After a warm front brought soaking rains to the region, a cold front brought additional rain. The heavy precipitation fell on already saturated ground resulting in both area and river flooding. Rainfall amounts of three to four inches were reported. Roads were flooded and closed in Akron, Rapids, Wolcottsville, Rochester, Athol Springs, Warsaw, Brighton, Cassadaga, and Macedon. Several area creeks and river exceeded flood stage. Black Creek at Churchville crested at 6.32 feet at 6:00 PM on the 7th (Flood Stage is 6 feet). \$10,000 in property damages were reported in Scottsville. \$10,000 were reported in Churchville.
August 14, 2018	Flash Flood	N/A	N/A	Railroad Mills, Bushnell Basin, Blackwatch Hills	A mid-level closed low, more typical of the cold season, passed slowly through PA and into eastern NY. Abundant moisture in the presence of this anomalous forcing produced heavy rain and flash flooding. The main corridors of heavy rain developed along fairly subtle deformation zones and subtle low level convergence zones in Oswego, Wayne, and Ontario counties, reaching eastern Monroe County by mid-morning.
May 17- 31, 2019	Flood	N/A	N/A	Troutberg, Manitou Beach	Excessive runoff into the Ottawa River Basin in Canada restricted the outlet of Lake Ontario. This combined with above normal precipitation into the Lake Ontario Basin, record levels on the Great Lakes above Lake Ontario, and higher than normal flows into the lake from the Niagara River pushed the lake to well above normal levels. Over the course of May, the levels quickly approached those reached in 2017, surpassing 5 feet above low water datum on May 17. The levels continued to increase through the end of the month, rising to near 5.5 feet above low water datum by May 31. \$2 million in property damage was reported in Troutberg.
June 1-30, 2019	Flood	N/A	N/A	Troutberg, Union Hill	Excessive runoff into the Ottawa River Basin in Canada restricted the outlet of Lake Ontario. This combined with above normal precipitation into the Lake Ontario Basin, record levels on the Great Lakes above Lake Ontario, and higher than normal flows into the lake from the Niagara River pushed the lake to well above normal levels. Over the course of June, new records were broken as the lake pushed to nearly 6 feet above low water datum and eclipsed the levels set in 2017. The lake peaked on June 10. \$1,000 in property damage was reported in Troutberg.
June 20, 2019	Flash Flood	N/A	N/A	Mendon, Henrietta, Bushnell Basin, Rush	Though the primary west to east oriented frontal boundary with upper 60s to low 70s dewpoints streaming into it remained south across Ohio and Pennsylvania, a deepening low pressure system crossing New York State and a very moist air mass resulted in a dynamic moisture-laden system dropping heavy rain from the Southern Tier through Oswego County. The rainfall intensity was also enhanced by a mesolow that moved through simultaneously. Overall, multiple locations saw rainfall totals over 3 inches in less than 12 hours. Numerous road closures occurred during the event including both directions of the Thruway near Rochester. The flooding was so extensive that a State of Emergency was declared for the entire County on Thursday afternoon. Many flash flood and areal flood warnings were issued during this event and some of these persisted well into Friday





Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
					morning. \$40,000 in property damages were reported in Mendon. \$10,000 in property damages were reported in Henrietta.
July 1-31, 2019	Flood	N/A	N/A	Troutberg	Excessive runoff into the Ottawa River Basin in Canada restricted the outlet of Lake Ontario. This combined with above normal precipitation into the Lake Ontario Basin, record levels on the Great Lakes above Lake Ontario, and higher than normal flows into the lake from the Niagara River pushed the lake to well above normal levels. Over the course of July, water levels began to slowly recede, however after starting the month about 5.5 feet above low water datum, the lake only fell to just below 5 feet above low water datum over the entirety of the month. \$500,000 in property damages were reported in Troutberg.
August 1- 24, 2019	Flood	N/A	N/A	Troutberg, Forest Lawn	Excessive runoff into the Ottawa River Basin in Canada through the early half of the summer restricted the outlet of Lake Ontario. This combined with above normal precipitation into the Lake Ontario Basin, record levels on the Great Lakes above Lake Ontario, and higher than normal flows into the lake from the Niagara River pushed the lake to well above normal levels. Over the course of August, while ongoing precipitation gradually started to seasonally decrease, and outgoing flows through the Moses Saunders Dam increased, it took the majority of month before the lake finally decreased below 4 feet above low water datum and flooding along the lakeshore finally subsided. \$50,000 in property damages were reported in Troutberg.
July 11, 2020	Flash Flood	N/A	N/A	Point Pleasant, Maplewood, West Webster	A sharp short wave trough embedded within a broad upper level trough over the northeastern U.S. supported a wave of convection that moved across the entire area. A precipitable water value of 1.65 inches was observed on the KBUF sounding, and models suggested over 2 inches in portions of the area. This combined with an incoming mesoscale convective vortex to drive slow-moving and heavy rain-producing thunderstorms. While shear was minimal in the environment, the MCV resulted in locally higher shear values, which enhanced wind damage across portions of the area.
July 8, 2021	Flash Flood	N/A	N/A	Point Pleasant	Showers and thunderstorms developed during the afternoon along a west-to-east oriented frontal boundary along the south shore of Lake Ontario. Thunderstorms developed first over the Niagara Peninsula, which then tracked into the Buffalo area. Another line of storms formed from Oswego to Onondaga counties. This line of storms expanded in coverage and severity while a north-south line of storms approached from Lake Ontario. These two lines merged over northern Oswego and southwest Jefferson counties, as velocity values increased near Sackets Harbor, where several trees were reported down. In Point Pleasant, Flooding was reported on Route 104 and 590. Deep water was reported on Titus Ave and Ridge Drive. Several water rescues were performed. \$50,000 in property damages were reported.
August 7, 2021	Flash Flood	N/A	N/A	Scottsville	An upper level trough axis moved into western New York during the evening hours. This feature moved into a modestly unstable environment fairly unimpressive precipitable water values of only just slightly over one inch. Further, low level moisture transport was unimpressive. A cluster of storms congealed around northern Livingston and southern Monroe counties. Weak flow and some back-building allowed for torrential rain over the area. A few spots had three inches per hour rainfall rates that lasted up to 55 minutes. This resulted in roads closed with water flowing over them in Monroe County.





Dates of	Event	FEMA Declaration	Monroe County		
Event October	Type Flood	Number N/A	Designated? N/A	Location Brighton	Losses / Impacts An upper level closed low meandered through the Great Lakes while slowly phasing with an Atlantic
26, 2021	11000		1011	Po, Northeast Henrietta	Nor'easter. Convergence along an inverted trough coincided with a strong push of Atlantic moisture to force periods of heavy rainfall south of Lake Ontario from Rochester eastward through the latter half of the day.
October 29-31, 2021	Flood	N/A	N/A	East Rochester, Brighton,	A broad occluded low advanced northeastward from the Ohio Valley. Easterly moisture feed off the Atlantic ahead of this system brought precipitable water values above 1 inch. A vast area of moderate and occasionally heavy rainfall resulted in areas of flooding.
				Rigney Bluff	incontract and occurrently nearly instrum resource in accurs of neocuring.
December 11, 2021	Seiche	N/A	N/A	Monroe County	A strong cold front crossed the region. Selected peak wind gusts included 60 mph at Rochester Airport. Strong surface high pressure over the southern Plains amplified the pressure gradient such that a lake seiche did occur on Lake Monroe with a smaller one evident on Lake Ontario, as well.

Source: NOAA-NCEI 2022; FEMA 2022; USACE 2022





Climate Change Impacts

Climate change is affecting both people and resources in New York State, and these impacts are projected to continue growing. *ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID)* was undertaken to provide decision-makers with information on the State's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1, Western New York and Great Lakes Plain. Attributes that will be affected by climate change include agricultural revenue, relatively low rainfall that may increase summer drought risk, high-value crops that may need irrigation, and projected improved conditions for grapes (NYSERDA 2011).

In Region 1, it is estimated that temperatures will increase by 3.7 °F to 7.3 °F by the 2050s and 4.2 °F to 12.0 °F by the 2080s (baseline of 47.7 °F). Precipitation totals will increase between 2 to 12 percent by the 2050s and 1 to 17 percent by the 2080s (baseline of 34.0 inches) (NYSERDA 2014).

The projected increase in precipitation is expected to occur in heavy downpours and less in light rains. Downpours are very likely to increase in frequency and intensity (NYSERDA 2014). Heavy rainfall can result in flooding events.

Overall regional precipitation is the primary driver of average Great Lakes water levels. Increases in annual precipitation will impact the elevation of lakes. Projected increases in precipitation totals are likely to increase the elevation of Lake Ontario. Temperatures are predicted to increase in Monroe County, which may lead to an increase in intensity and frequency of severe storm events. This increase may lead to more weather patterns that cause flooding events.

Increasing air temperatures intensify the water cycle by increasing evaporation and precipitation. This can cause an increase in rain totals during events with longer dry periods in between those events. These changes can have a variety of effects on the State's water resources (NYSERDA 2011). Figure 5.4.5-7 displays the project rainfall and frequency of extreme storms in New York State. The amount of rain fall in a 100-year event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA 2011).





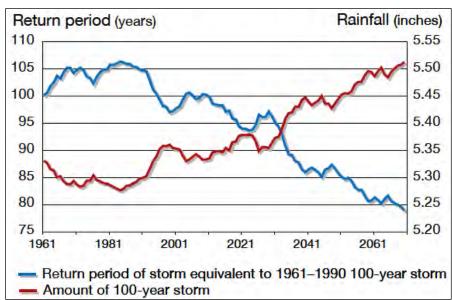


Figure 5.4.5-7. Projected Rainfall and Frequency of Extreme Storms

Source: NYSERDA 2011

Assumptions about a river's flow behavior, expressed as hydrographs are influences for dam design. Changes in weather patterns can significantly affect the hydrograph used for the design of a dam. If the hygrograph changes, the dam conceivably could lose some or all of its designed margin of safety, also known as freeboard. Loss of designed margin of safety increases possibility that floodwaters would overtop the dam or create unintended loads, which could lead to a dam failure.

Probability of Future Occurrences

Based on the historic and more recent flood events in Monroe County, and the future climate projections for this region, the County has a moderate probability of future flooding. It is anticipated that Monroe County will continue to experience direct and indirect impacts of flooding events annually that may induce secondary hazards such as infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents, and inconveniences. Additionally, climate change is expected to increase the severity and frequency of heavy rain events in Monroe County. This is likely to lead to an increase in flooding events. According to available record keeping, Monroe County has a 100% annual chance of occurrence of flood events in any given year.

Hazard Type	Number of Occurrences Between 1996 and 2022	% chance of occurrence in any given year
Coastal/Lakeshore Flood	8	30.77%
Dam Failure	0	0%
Flash Flood	31	100%
Flood	30	100%
Ice Jam	0	0%
Seiche	1	3.85%
TOTAL	70	100%

Table 5.4.5-7. Probability of Future Occurrence of Flooding Events

Source: NOAA-NCEI 2022; USACE 2022; NPDP 2022; FEMA 2022

Note: Disaster occurrences include federally declared disasters and selected flood events between January 1, 1996 and January 1, 2022. Due to limitations in data, not all flood events occurring between 1996 and June 2022 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is underestimated.





Section 5.3 ranks the identified hazards of concern for Monroe County. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, the probability of occurrence for flood in the County is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year. as noted in Table 5.3-2).





5.4.5.2 Vulnerability Assessment

To assess Monroe County's risk to the flood hazard, a spatial analysis was conducted using the FEMA Risk Map effective dated 2008. Preliminary products dated September 30, 2022 were received from FEMA at the completion of the risk assessment. Information from the Preliminary Flood Insurance Study was used to update the flood profile but the analysis used for the vulnerability assessment is based on the effective FIRM. The 1 and 0.2-percent annual chance flood events were examined to determine the assets located in the hazard areas and to estimate potential loss using the FEMA Hazus riverine flood model. These results are summarized below.

Impact on Life, Health and Safety

The impact of flooding on life, health, and safety is dependent upon several factors, including the severity of the event and whether or not adequate warning time is provided to residents. Exposure represents the population living in or near floodplain areas that could be impacted should a flood event occur. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but everyone who may be affected by the effects of a hazard event (e.g., people are at risk while traveling in flooded areas, or their access to emergency services is compromised during an event). The degree of that impact will vary and is not strictly measurable.

To estimate population exposure to the 1-percent and 0.2-percent annual chance flood events, the DFIRM flood boundaries were used. Based on the spatial analysis, there are an estimated 6,364 residents living in the 1-percent annual chance floodplain or 0.8 percent of the County's total population. There are an estimated 9,104 residents living in the 0.2-percent annual chance floodplain, or 1.2 percent of the County's total population. The Town of Gates has the greatest number of residents living in the floodplain, with approximately 2,059 residents living in the Special Flood Hazard Area (SFHA) and 2,261 people living in the 0.2-percent annual chance floodplain. Table 5.4.5-8. Estimated Population Exposed to the 1-percent and **0.2-percent Annual Chance Flood Event Hazard Area**

summarizes the population exposed to the flood hazard by jurisdiction.

		Estimated Po	pulation Located	l in the Flood Hazard Are	as
Jurisdiction	Total Population (2020 Decennial Census)	Number of Persons Located in the 1-percent Annual Chance Flood Event Hazard Area	Percent of Total	Number of Persons Located in the 0.2- percent Annual Chance Flood Event Hazard Area	Percent of Total
Brighton (T)	37,137	199	0.5%	546	1.5%
Brockport (V)	7,104	0	0.0%	0	0.0%
Chili (T)	29,123	721	2.5%	1,050	3.6%
Churchville (V)	2,091	7	0.4%	27	1.3%
Clarkson (T)	6,904	18	0.3%	21	0.3%
East Rochester (T/V)	6,334	0	0.0%	0	0.0%
Fairport (V)	5,501	33	0.6%	33	0.6%
Gates (T)	29,167	2,059	7.1%	2,261	7.8%
Greece (T)	96,926	351	0.4%	528	0.5%
Hamlin (T)	8,725	427	4.9%	427	4.9%

Table 5.4.5-8. Estimated Population Exposed to the 1-percent and 0.2-percent Annual Chance FloodEvent Hazard Area





		Estimated Po	pulation Located	l in the Flood Hazard Are	as
Jurisdiction	Total Population (2020 Decennial Census)	Number of Persons Located in the 1-percent Annual Chance Flood Event Hazard Area	Percent of Total	Number of Persons Located in the 0.2- percent Annual Chance Flood Event Hazard Area	Percent of Total
Henrietta (T)	47,096	722	1.5%	1,265	2.7%
Hilton (V)	6,027	32	0.5%	63	1.0%
Honeoye Falls (V)	2,706	12	0.5%	84	3.1%
Irondequoit (T)	51,043	366	0.7%	621	1.2%
Mendon (T)	6,389	58	0.9%	93	1.5%
Ogden (T)	16,585	53	0.3%	133	0.8%
Parma (T)	10,190	460	4.5%	501	4.9%
Penfield (T)	39,438	167	0.4%	234	0.6%
Perinton (T)	39,128	91	0.2%	115	0.3%
Pittsford (T)	25,714	101	0.4%	202	0.8%
Pittsford (V)	1,419	0	0.0%	0	0.0%
Riga (T)	3,495	41	1.2%	77	2.2%
Rochester (C)	211,328	78	0.0%	177	0.1%
Rush (T)	3,490	12	0.4%	65	1.9%
Scottsville (V)	2,009	39	1.9%	160	8.0%
Spencerport (V)	3,685	18	0.5%	23	0.6%
Sweden (T)	6,140	12	0.2%	12	0.2%
Webster (T)	39,676	244	0.6%	296	0.7%
Webster (V)	5,651	0	0.0%	8	0.1%
Wheatland (T)	2,888	43	1.5%	80	2.8%
Monroe County (Total)	753,109	6,364	0.8%	9,104	1.2%

Source: FEMA 2008; US Census 2020

Notes: % = Percent; C = City; T = Town; V = Village

Research has shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. This is due to many factors, including their physical and financial ability to react or respond during a hazard. Of the population exposed, the most vulnerable include the economically disadvantaged and the population over age 65. Economically disadvantaged populations may be more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impacts on their families. The population over age 65 is also more vulnerable because they are more likely to seek or need medical attention that may not be available due to isolation during a flood event, and they may have more difficulty evacuating. Within Monroe County, there are approximately 127,588 people over the age of 65 (16.9 percent of the County population) and 100,484 people below the poverty level (13.3 percent of the County population (American Community Survey 2020).

The Centers for Disease Control and Prevention (CDC) 2016 Social Vulnerability Index (SVI) ranks U.S. Census tracts on socioeconomic status, household composition and disability, minority status and language, and housing and transportation. Monroe County's overall score is 0.5204, indicating that its communities have a moderate to high level of social vulnerability (CDC 2018). This score indicates that some County residents may not have enough resources to respond to flood events.





Using 2020 U.S. Census data, Hazus estimates the potential sheltering needs as a result of a 1-percent annual chance flood event. For the 1-percent flood event, Hazus estimates 15,752 individuals will be displaced, and 3,775 people will seek short-term sheltering. These statistics, by jurisdiction and by flood zone, are presented in Table 5.4.5-9.

Table 5.4.5-9. Estimated Population Displaced or Seeking Short-Term Shelter from the 1-percent
Annual Chance Flood Event Hazard Area

		1-Percent Ann	ercent Annual Chance Flood Event		
Jurisdiction	Total Population (2020 Decennial Census)	Displaced Population*	Persons Seeking Short- Term Sheltering		
Brighton (T)	37,137	617	209		
Brockport (V)	7,104	38	20		
Chili (T)	29,123	1,354	153		
Churchville (V)	2,091	41	14		
Clarkson (T)	6,904	164	94		
East Rochester (T/V)	6,334	40	3		
Fairport (V)	5,501	136	23		
Gates (T)	29,167	2,761	450		
Greece (T)	96,926	1,384	478		
Hamlin (T)	8,725	346	79		
Henrietta (T)	47,096	3,170	455		
Hilton (V)	6,027	251	53		
Honeoye Falls (V)	2,706	151	37		
Irondequoit (T)	51,043	351	99		
Mendon (T)	6,389	244	71		
Ogden (T)	16,585	410	138		
Parma (T)	10,190	599	131		
Penfield (T)	39,438	796	214		
Perinton (T)	39,128	340	124		
Pittsford (T)	25,714	823	263		
Pittsford (V)	1,419	4	1		
Riga (T)	3,495	141	26		
Rochester (C)	211,328	308	131		
Rush (T)	3,490	138	38		
Scottsville (V)	2,009	85	16		
Spencerport (V)	3,685	79	34		
Sweden (T)	6,140	31	19		
Webster (T)	39,676	812	373		
Webster (V)	5,651	8	8		
Wheatland (T)	2,888	130	21		
Monroe County (Total)	753,109	15,752	3,775		

Source: Hazus v5.1; Census 2020; FEMA 2008

Notes: C = City; T = Town; V = Village

*The number of displaced persons may overestimate the impacted population located in the 1-percent annual chance flood hazard area due to the limitations of the Hazus model using Census 2010 census block data

The total number of injuries and casualties resulting from flooding is generally limited based on advance weather forecasting, blockades, and warnings. More likely, persons could become displaced from their homes or may seek shelter due to the impacts of a flood event. Therefore, injuries and deaths generally are not anticipated if proper warning and precautions are in place. Ongoing mitigation efforts should help to avoid the most likely cause of injury, which results from persons trying to cross flooded roadways or channels during a flood.





Dam failure can cause, in the most extreme case, loss of life and extensive property damage, or in the least extreme case, no loss of life or significant property damage. Dam failure can cause persons to become displaced if flooding of structures occurs. Dam failure may mimic flood events, depending on the size of the dam reservoir and breach. Dam failure inundation modeling estimates the potential impacts of a failure; however, this data is considered sensitive information and is not displayed or discussed further in the HMP.

Cascading impacts of flooding and dam failure inundation may also include exposure to pathogens such as mold. After flood events, excess moisture and standing water contribute to the growth of mold in buildings. Mold may present a health risk to building occupants, especially those with already compromised immune systems such as infants, children, the elderly, and pregnant women. The degree of impact will vary and is not strictly measurable. Mold spores can grow in as short a period as 24–48 hours in wet and damaged areas of buildings that have not been properly cleaned. Very small mold spores can easily be inhaled, creating the potential for allergic reactions, asthma episodes, and other respiratory problems. Buildings should be properly cleaned and dried out to safely prevent mold growth (CDC 2019).

Molds and mildews are not the only public health risk associated with flooding. Floodwaters can be contaminated by pollutants such as sewage, human and animal feces, pesticides, fertilizers, oil, asbestos, and rusting building materials. Common public health risks associated with flood events also include:

- Unsafe food
- Contaminated drinking and washing water and poor sanitation
- Mosquitos and animals
- Carbon monoxide poisoning
- Secondary hazards associated with re-entering/cleaning flooded structures
- Mental stress and fatigue

Current loss estimation models such as Hazus are not equipped to measure public health impacts. The best level of mitigation for these impacts is to be aware that they can occur, educate the public on prevention, and be prepared to deal with these vulnerabilities in responding to flood events.

Impact on General Building Stock

Exposure to the flood hazard includes those buildings located in the flood zone or those that are built downstream in other flood inundation areas such as dam failure inundation areas. The potential damage is the modeled loss that could occur to the exposed inventory measured by the structural and content replacement cost value. There are an estimated 3,434 and 4,741 buildings located in the 1-percent and 0.2-percent annual chance flood event hazard area, respectively. This represents approximately 1.7 percent and 2.4 percent of the County's total general building stock inventory replacement cost value, respectively (approximately \$315 billion). The Town of Amherst has the greatest number of its buildings located in the 1-percent annual chance floodplain (859 buildings or 7.3 percent of its total building stock). The Town of Gates also has the greatest number of its buildings located in the 0.2-percent annual chance floodplain (948 buildings or 8.0 percent of its total building stock). Refer to Table 5.4.5-10 and Table 5.4.5-11 for the estimated exposure of 1-percent and 0.2-percent flood events by jurisdiction. Refer to Table 5.4.5-12 for the Hazus estimated losses by jurisdiction, for residential, commercial, and other occupancy structures, respectively.





Table 5.4.5-10. Estimated General Building Stock Exposure to the 1-percent Annual Chance Flood Event

			Estimated Building Stock Exposed to 1-percent Annual Chance Flood Total (All Flood Zones)				
Jurisdiction	No. of Bldgs.	Total RCV	No. of Bldgs.	% of Bldgs.	RCV	% of RCV	
Brighton (T)	11,693	\$14,443,886,002	103	0.9%	\$213,586,534	1.5%	
Brockport (V)	2,224	\$5,158,789,593	1	0.0%	\$39,636	0.0%	
Chili (T)	11,534	\$9,206,843,885	393	3.4%	\$482,297,684	5.2%	
Churchville (V)	1,112	\$938,164,078	8	0.7%	\$24,672,941	2.6%	
Clarkson (T)	3,411	\$1,887,392,030	19	0.6%	\$5,637,155	0.3%	
East Rochester (T/V)	2,924	\$3,440,171,127	10	0.3%	\$12,439,986	0.4%	
Fairport (V)	2,394	\$2,281,456,075	24	1.0%	\$111,099,188	4.9%	
Gates (T)	11,801	\$12,220,599,285	859	7.3%	\$958,205,170	7.8%	
Greece (T)	36,414	\$26,954,378,684	177	0.5%	\$201,638,152	0.7%	
Hamlin (T)	5,539	\$2,318,778,027	263	4.7%	\$92,814,703	4.0%	
Henrietta (T)	15,982	\$23,460,566,322	298	1.9%	\$752,071,581	3.2%	
Hilton (V)	2,143	\$2,120,287,988	26	1.2%	\$29,214,194	1.4%	
Honeoye Falls (V)	1,155	\$1,813,180,690	10	0.9%	\$62,440,877	3.4%	
Irondequoit (T)	21,885	\$13,427,006,840	167	0.8%	\$200,796,580	1.5%	
Mendon (T)	3,835	\$2,852,155,915	66	1.7%	\$26,404,916	0.9%	
Ogden (T)	7,407	\$5,558,087,440	37	0.5%	\$16,130,704	0.3%	
Parma (T)	5,509	\$3,373,412,574	273	5.0%	\$116,899,100	3.5%	
Penfield (T)	15,882	\$11,119,233,991	114	0.7%	\$533,803,786	4.8%	
Perinton (T)	16,817	\$13,125,415,407	61	0.4%	\$129,204,988	1.0%	
Pittsford (T)	10,590	\$10,686,774,000	67	0.6%	\$79,733,209	0.7%	
Pittsford (V)	804	\$1,776,834,511	0	0.0%	\$0	0.0%	
Riga (T)	2,356	\$1,539,492,845	43	1.8%	\$14,096,853	0.9%	
Rochester (C)	89,392	\$119,943,371,056	92	0.1%	\$630,278,220	0.5%	
Rush (T)	2,808	\$1,816,445,354	32	1.1%	\$26,123,114	1.4%	
Scottsville (V)	1,069	\$908,716,753	27	2.5%	\$52,390,410	5.8%	
Spencerport (V)	1,654	\$1,580,844,696	16	1.0%	\$109,432,916	6.9%	
Sweden (T)	3,465	\$3,402,258,236	12	0.3%	\$33,922,259	1.0%	
Webster (T)	16,660	\$11,510,191,170	186	1.1%	\$298,781,447	2.6%	
Webster (V)	1,633	\$3,634,066,282	0	0.0%	\$0	0.0%	
Wheatland (T)	1,926	\$2,509,077,040	50	2.6%	\$149,490,023	6.0%	
Monroe County (Total)	312,018	\$315,007,877,896	3,434	1.1%	\$5,363,646,328	1.7%	

Source: FEMA 2008; Monroe County GIS - 2022

Notes C = City; T = Town; V = Village

No. = Number Bldgs. = Buildings RCV = Replacement Cost Value

% = Percent

Table 5.4.5-11. Estimated General Building Stock Exposure to the 0.2-percent Annual Chance FloodEvent

			Estimated Building Stock Exposed to 0.2-percen Annual Chance Flood Total (All Flood Zones)			
Jurisdiction	No. of Bldgs.	Total RCV	No. of Bldgs.	% of Bldgs.	RCV	% of RCV
Brighton (T)	11,693	\$14,443,886,002	239	2.0%	\$442,678,446	3.1%
Brockport (V)	2,224	\$5,158,789,593	1	0.0%	\$39,636	0.0%





			Estimat	g Stock Exposed to 0.2 ual Chance Flood (All Flood Zones)	0.2-percent	
Jurisdiction	No. of Bldgs.	Total RCV	No. of Bldgs.	% of Bldgs.	RCV	% of RCV
Chili (T)	11,534	\$9,206,843,885	550	4.8%	\$630,401,906	6.8%
Churchville (V)	1,112	\$938,164,078	30	2.7%	\$45,548,971	4.9%
Clarkson (T)	3,411	\$1,887,392,030	20	0.6%	\$6,117,188	0.3%
East Rochester (T/V)	2,924	\$3,440,171,127	10	0.3%	\$12,439,986	0.4%
Fairport (V)	2,394	\$2,281,456,075	25	1.0%	\$116,287,556	5.1%
Gates (T)	11,801	\$12,220,599,285	948	8.0%	\$1,087,132,130	8.9%
Greece (T)	36,414	\$26,954,378,684	263	0.7%	\$237,007,370	0.9%
Hamlin (T)	5,539	\$2,318,778,027	263	4.7%	\$92,814,703	4.0%
Henrietta (T)	15,982	\$23,460,566,322	528	3.3%	\$1,504,472,788	6.4%
Hilton (V)	2,143	\$2,120,287,988	39	1.8%	\$62,058,166	2.9%
Honeoye Falls (V)	1,155	\$1,813,180,690	40	3.5%	\$73,122,162	4.0%
Irondequoit (T)	21,885	\$13,427,006,840	266	1.2%	\$231,863,436	1.7%
Mendon (T)	3,835	\$2,852,155,915	101	2.6%	\$54,743,506	1.9%
Ogden (T)	7,407	\$5,558,087,440	71	1.0%	\$34,660,734	0.6%
Parma (T)	5,509	\$3,373,412,574	293	5.3%	\$155,829,272	4.6%
Penfield (T)	15,882	\$11,119,233,991	147	0.9%	\$578,866,676	5.2%
Perinton (T)	16,817	\$13,125,415,407	72	0.4%	\$134,944,860	1.0%
Pittsford (T)	10,590	\$10,686,774,000	106	1.0%	\$98,807,281	0.9%
Pittsford (V)	804	\$1,776,834,511	0	0.0%	\$0	0.0%
Riga (T)	2,356	\$1,539,492,845	67	2.8%	\$22,112,002	1.4%
Rochester (C)	89,392	\$119,943,371,056	146	0.2%	\$1,073,233,890	0.9%
Rush (T)	2,808	\$1,816,445,354	77	2.7%	\$117,508,300	6.5%
Scottsville (V)	1,069	\$908,716,753	99	9.3%	\$109,706,429	12.1%
Spencerport (V)	1,654	\$1,580,844,696	24	1.5%	\$151,780,270	9.6%
Sweden (T)	3,465	\$3,402,258,236	12	0.3%	\$33,922,259	1.0%
Webster (T)	16,660	\$11,510,191,170	231	1.4%	\$362,010,249	3.1%
Webster (V)	1,633	\$3,634,066,282	4	0.2%	\$3,498,418	0.1%
Wheatland (T)	1,926	\$2,509,077,040	69	3.6%	\$162,556,051	6.5%
Monroe County (Total)	312,018	\$315,007,877,896	4,741	1.5%	\$7,636,164,640	2.4%

Source: FEMA 2008; Monroe County GIS - 2022

Notes: C = City; T = Town; V = Village; No. = Number; Bldgs. = Buildings; RCV = Replacement Cost Value; % = Percent





Table 5.4.5-12. Estimated Building Stock Potential Loss by Occupancy to the 1-percent Annual Chance Flood Event

		All Occu					ducation and		
Jurisdiction	Total Replacement Cost Value (RCV)	Estimated Loss	Percent of Total Replacement Cost Value						
Brighton (T)	\$14,443,886,002	\$46,986,950	0.3%	\$3,156,992	<0.1%	\$43,829,959	0.3%	\$0	0
Brockport (V)	\$5,158,789,593	\$16,321	<0.1%	\$16,321	<0.1%	\$0	0.0%	\$0	0.0%
Chili (T)	\$9,206,843,885	\$89,948,027	1.0%	\$14,294,304	0.2%	\$71,643,615	0.8%	\$4,010,108	0.0%
Churchville (V)	\$938,164,078	\$12,837,066	1.4%	\$245,553	<0.1%	\$12,591,513	1.3%	\$0	0.0%
Clarkson (T)	\$1,887,392,030	\$1,320,813	0.1%	\$494,101	<0.1%	\$826,712	<0.1%	\$0	0.0%
East Rochester (T/V)	\$3,440,171,127	\$7,048,982	0.2%	\$0	0.0%	\$7,048,982	0.2%	\$0	0.0%
Fairport (V)	\$2,281,456,075	\$26,312,562	1.2%	\$597,695	<0.1%	\$16,298,446	0.7%	\$9,416,420	0.4%
Gates (T)	\$12,220,599,285	\$161,774,175	1.3%	\$64,828,565	0.5%	\$24,908,268	0.2%	\$72,037,342	0.6%
Greece (T)	\$26,954,378,684	\$44,027,928	0.2%	\$3,763,943	<0.1%	\$29,924,197	0.1%	\$10,339,787	0.0%
Hamlin (T)	\$2,318,778,027	\$9,885,201	0.4%	\$6,076,084	0.3%	\$3,809,117	0.2%	\$0	0.0%
Henrietta (T)	\$23,460,566,322	\$102,716,207	0.4%	\$19,502,735	0.1%	\$75,471,577	0.3%	\$7,741,895	0.0%
Hilton (V)	\$2,120,287,988	\$13,740,978	0.6%	\$5,473,538	0.3%	\$3,699,699	0.2%	\$4,567,741	0.2%
Honeoye Falls (V)	\$1,813,180,690	\$5,595,603	0.3%	\$788,497	<0.1%	\$4,807,106	0.3%	\$0	0.0%
Irondequoit (T)	\$13,427,006,840	\$24,526,845	0.2%	\$9,376,740	0.1%	\$15,150,105	0.1%	\$0	0.0%
Mendon (T)	\$2,852,155,915	\$4,254,529	0.1%	\$1,364,496	<0.1%	\$2,797,623	0.1%	\$92,411	0.0%
Ogden (T)	\$5,558,087,440	\$7,749,493	0.1%	\$1,283,128	<0.1%	\$6,466,365	0.1%	\$0	0.0%
Parma (T)	\$3,373,412,574	\$15,599,682	0.5%	\$4,334,718	0.1%	\$11,235,526	0.3%	\$29,438	0.0%
Penfield (T)	\$11,119,233,991	\$180,269,903	1.6%	\$3,635,455	<0.1%	\$77,381,175	0.7%	\$99,253,273	0.9%
Perinton (T)	\$13,125,415,407	\$31,658,359	0.2%	\$1,158,016	<0.1%	\$30,212,859	0.2%	\$287,485	0.0%
Pittsford (T)	\$10,686,774,000	\$31,917,544	0.3%	\$4,384,133	<0.1%	\$27,027,912	0.3%	\$505,498	0.0%
Pittsford (V)	\$1,776,834,511	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Riga (T)	\$1,539,492,845	\$4,657,675	0.3%	\$1,800,825	0.1%	\$2,856,851	0.2%	\$0	0.0%
Rochester (C)	\$119,943,371,056	\$99,048,238	0.1%	\$4,470,305	<0.1%	\$94,554,734	0.1%	\$23,199	0.0%
Rush (T)	\$1,816,445,354	\$6,468,363	0.4%	\$1,911	<0.1%	\$1,558,162	0.1%	\$4,908,291	0.3%
Scottsville (V)	\$908,716,753	\$27,743,284	3.1%	\$797,907	0.1%	\$23,096,795	2.5%	\$3,848,583	0.4%
Spencerport (V)	\$1,580,844,696	\$714,602	0.0%	\$535,322	<0.1%	\$179,280	<0.1%	\$0	0.0%
Sweden (T)	\$3,402,258,236	\$12,072,993	0.4%	\$13,171	<0.1%	\$12,059,821	0.4%	\$0	0.0%
Webster (T)	\$11,510,191,170	\$78,992,844	0.7%	\$5,052,492	<0.1%	\$71,274,252	0.6%	\$2,666,101	0.0%





		All Occu	pancies	Resid	ential	Commercial		Agricultural, Industrial, Religious, Education and Government	
Jurisdiction	Total Replacement Cost Value (RCV)	Estimated Loss	Percent of Total Replacement Cost Value	Estimated Loss	Percent of Total Replacement Cost Value	Estimated Loss	Percent of Total Replacement Cost Value	Estimated Loss	Percent of Total Replacement Cost Value
Webster (V)	\$3,634,066,282	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Wheatland (T)	\$2,509,077,040	\$33,260,790	1.3%	\$774,805	<0.1%	\$1,849,023	0.1%	\$30,636,962	1.2%
Monroe County (Total)	\$315,007,877,896	\$1,081,145,959	0.3%	\$158,221,751	0.1%	\$672,559,674	0.2%	\$250,364,535	0.1%

Source: Hazus v5.1; Monroe County GIS 2022; FEMA 2008 Notes: C = City; T = Town; V = Village





NFIP Statistics

In addition to total building stock modeling, individual data available on flood policies, claims, repetitive loss (RL) properties, and severe RL (SRL) properties were analyzed. FEMA Region 2 provided a list of residential properties with NFIP policies, past claims, and multiple claims (RLs). According to the metadata provided, "The (*sic* National Flood Insurance Program) NFIP Repetitive Loss File contains losses reported from individuals who have flood insurance through the Federal Government. A property is considered a repetitive loss property when there are two or more losses reported that were paid more than \$1,000 for each loss. The two losses must be within 10 years of each other & be as least 10 days apart. Only losses from (*sic* since) January 1, 1978 that are closed are considered."

SRLs were then examined for Monroe County. According to Section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 *United States Code* (U.S.C.) 4102a, an SRL property is defined as a residential property covered under an NFIP flood insurance policy, and satisfying either of conditions 1 and 2, as well as condition 3:

- 1. At least four NFIP claim payments for the property (including building and contents) over \$5,000 each have occurred, and the cumulative amount of such claims payments exceeded \$20,000.
- 2. At least two separate claims payments for the property (building payments only) have occurred, and the cumulative amount of the building portion of such claims exceeded the market value of the building.
- 3. For either of the above, at least two of the referenced claims must have occurred within any 10-year period, and must have occurred more than 10 days apart.

Table 5.4.5-13 through Table 5.4.5-15 summarizes NFIP policies, claims, and repetitive loss statistics for Monroe County as of December 2022. According to FEMA, Table 5.4.5-13 summarizes occupancy classes of RL properties in Monroe County. The majority of properties within the RL occupancy class are single-family residences (74.4 percent). Severe repetitive loss data was not available. This information is current as of December 2022.

Occupancy Class	Total Number of Repetitive Loss Properties
Single Family	32
Condo	0
2-4 Family	1
Other Residential	7
Business-Non-Residential	2
Other Non-Residential	1
Monroe County	43

Table 5.4.5-13. Occupancy Class of Repetitive Loss Structures in Monroe County

Source: FEMA Region 2 2022

Notes: Repetitive loss statistics provided by FEMA Region 2, and current as of December 2022.

Table 5.4.5-14. Occupancy Class of Repetitive Loss Structures in Monroe County by Municipality

	Repetitive Loss Properties								
Municipality	2-4 Family								
Brighton (T)	0	0	0	0	0	1			
Brockport (V)	0	0	0	0	0	0			





			Repetitive I	Loss Properties		
Municipality	2-4 Family	Assumed Condo	Business-Non Residential	Other-Non Residential	Other Residential	Single Family
Chili (T)	0	0	0	0	0	1
Churchville (V)	0	0	0	0	0	0
Clarkson (T)	0	0	0	0	0	0
East Rochester (V/T)	0	0	0	0	0	0
Fairport (V)	0	0	0	0	0	0
Gates (T)	0	0	0	0	0	1
Greece (T)	0	0	0	0	0	8
Hamlin (T)	0	0	0	0	0	5
Henrietta (T)	0	0	0	0	1	0
Hilton (V)	0	0	0	0	0	0
Honeoye Falls (V)	0	0	0	0	0	0
Irondequoit (T)	0	0	1	0	0	3
Mendon (T)	0	0	0	0	0	1
Ogden (T)	1	0	0	0	0	0
Parma (T)	0	0	0	0	1	1
Penfield (T)	0	0	0	0	5	0
Perinton (T)	0	0	0	0	0	4
Pittsford (T)	0	0	0	0	0	3
Pittsford (V)	0	0	0	0	0	0
Riga (T)	0	0	0	0	0	0
Rochester (C)	0	0	1	0	0	1
Rush (T)	0	0	0	0	0	0
Scottsville (V)	0	0	0	0	0	0
Spencerport (V)	0	0	0	1	0	0
Sweden (T)	0	0	0	0	0	0
Webster (T)	0	0	0	0	0	1
Webster (V)	0	0	0	0	0	0
Wheatland (T)	0	0	0	0	0	2
Monroe County (Total)	1	0	2	1	7	32

Source: FEMA Region 2 2022

Notes:

Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA Region 2, and current as of December 2022.

Statistics summarized using the Community Name provided by FEMA Region 2. Severe repetitive loss properties data was unavailable.

CTCity

Town

VVillage





Table 5.4.5-15. NFIP Statistics in Monroe County

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (1)	# Rep. Loss Prop. (2)	# Policies in the 1% Flood Boundary (1)
Brighton (T)	110	13	\$50,901	1	35
Brockport (V)	3	1	\$1,238	0	0
Chili (T)	181	24	\$111,637	1	136
Churchville (V)	8	0	\$0	0	4
Clarkson (T)	6	6	\$9,711	0	3
East Rochester (V/T)	0	0	\$0	0	0
Fairport (V)	7	1	\$500	0	5
Gates (T)	336	18	\$53,777	1	290
Greece (T)	192	63	\$384,960	8	62
Hamlin (T)	81	23	\$100,161	5	53
Henrietta (T)	180	26	\$126,713	1	89
Hilton (V)	20	11	\$435,822	0	10
Honeoye Falls (V)	18	2	\$17,355	0	4
Irondequoit (T)	72	11	\$28,451	4	35
Mendon (T)	23	3	\$20,426	1	13
Ogden (T)	26	5	\$152,841	1	11
Parma (T)	100	9	\$46,158	2	77
Penfield (T)	62	21	\$444,541	5	26
Perinton (T)	59	20	\$229,926	4	24
Pittsford (T)	82	15	\$116,032	3	26
Pittsford (V)	4	0	\$0	0	2
Riga (T)	8	1	\$1,476	0	6
Rochester (C)	90	17	\$88,889	2	35
Rush (T)	10	3	\$1,850	0	4
Scottsville (V)	18	2	\$12,920	0	14
Spencerport (V)	13	10	\$161,550	1	4
Sweden (T)	6	1	\$1,515	0	3
Webster (T)	71	26	\$95,931	1	43
Webster (V)	8	2	\$101,403	0	0
Wheatland (T)	21	22	\$599,758	2	4
Monroe County (Total)	1,815	356	\$3,396,444	43	1,108

Source: FEMA Region 2 2022, 2015

Note (1): Policies, claims, provided by FEMA Region 2, and are current as of June 30, 2015.

Note (2): Repetitive loss count provided by FEMA Region 2, and current as of December 2022.

Note (3): Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file as of June 30, 2015.

FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible. Number of policies and claims, and claims total, exclude properties outside Monroe County boundary, based on provided latitude and longitude coordinates.

C City

T Town

V Village





Impact on Critical Facilities

It is important to determine the critical facilities and infrastructure within the County that may be at risk to flooding and who may be impacted should damage occur. Critical services during and after a flood event may not be available if critical facilities are directly damaged or transportation routes to access these critical facilities are impacted. Roads that are blocked or damaged can isolate residents and can prevent access throughout the planning area to many service providers needing to get to vulnerable populations or to make repairs. Utilities such as overhead power, cable, and phone lines could also be vulnerable due to utility poles damaged by standing water or the surge of water from a dam failure event. Loss of these utilities could create additional isolation issues for the inundation zones.

Major roadways that may be impacted by the 1-percent annual chance flood event include Interstates I-490, I-390, and I-590, and various state and County roads. There are several issues associated with transportation routes flooding, including isolation caused by bridges being washed out or blocked by floods or debris, health problems caused by water and sewer systems that are flooded or backed up, drinking water contamination caused by floodwaters carrying pollutants in water supplies, and localized urban flooding caused by culverts blocked with debris.

Critical facility exposure to the 1-percent and 0.2-percent annual chance flood hazard event boundary was examined. In addition, Hazus was used to estimate the flood loss potential to critical facilities located in the FEMA mapped floodplains. Table 5.4.5-16. and Table 5.4.5-17 summarize the number of critical facilities exposed to the 1-percent and 0.2-percent flood inundation areas by jurisdiction. Of the 59 critical facilities located in the 1-percent annual chance flood event boundary, all 59 are considered lifelines for the County. Out of the 71 critical facilities located in the 0.2-percent annual chance flood event boundary, 70 are considered lifelines for the County. Table 5.4.5-18. shows the number of lifeline facilities by category in the 1-percent and 0.2-percent annual chance flood event boundary. Refer to Section 4 (County Profile) for more information about the critical facilities and lifelines in Monroe County.

			Number of Critical Facilities and Lifeline Facilities Located in the 1-Percent Annual Chance Flood Event Hazard Area				
Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines	
Brighton (T)	69	65	4	5.8%	4	6.2%	
Brockport (V)	29	28	0	0.0%	0	0.0%	
Chili (T)	111	102	11	9.9%	11	10.8%	
Churchville (V)	24	23	0	0.0%	0	0.0%	
Clarkson (T)	14	10	0	0.0%	0	0.0%	
East Rochester (T/V)	31	29	1	3.2%	1	3.4%	
Fairport (V)	17	16	0	0.0%	0	0.0%	
Gates (T)	58	54	2	3.4%	2	3.7%	
Greece (T)	165	158	6	3.6%	6	3.8%	
Hamlin (T)	23	22	0	0.0%	0	0.0%	
Henrietta (T)	111	103	1	0.9%	1	1.0%	

Table 5.4.5-16. Number of Critical Facilities Located in the 1-percent Annual Chance Flood Hazard Area



			Number of Critical Facilities and Lifeline Facilities Located in the 1-Percent Annua Chance Flood Event Hazard Area			t Annual
Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Hilton (V)	21	20	0	0.0%	0	0.0%
Honeoye Falls (V)	17	16	3	17.6%	3	18.8%
Irondequoit (T)	103	100	0	0.0%	0	0.0%
Mendon (T)	21	20	0	0.0%	0	0.0%
Ogden (T)	42	38	0	0.0%	0	0.0%
Parma (T)	18	16	0	0.0%	0	0.0%
Penfield (T)	73	68	3	4.1%	3	4.4%
Perinton (T)	64	57	2	3.1%	2	3.5%
Pittsford (T)	45	39	2	4.4%	2	5.1%
Pittsford (V)	14	13	0	0.0%	0	0.0%
Riga (T)	20	18	1	5.0%	1	5.6%
Rochester (C)	639	605	11	1.7%	11	1.8%
Rush (T)	29	26	3	10.3%	3	11.5%
Scottsville (V)	14	13	0	0.0%	0	0.0%
Spencerport (V)	13	13	0	0.0%	0	0.0%
Sweden (T)	11	11	1	9.1%	1	9.1%
Webster (T)	55	53	1	1.8%	1	1.9%
Webster (V)	16	15	0	0.0%	0	0.0%
Wheatland (T)	23	21	7	30.4%	7	33.3%
Monroe County (Total)	1,890	1,773	59	3.1%	59	3.3%

FEMA 2008; Monroe County GIS 2022 C = City; T = Town; V = Village % = Percent Source:

Notes:

Table 5.4.5-17. Number of Critical Facilities Located in the 0.2-percent Annual Chance Flood Hazard Area

			Number of Critical Facilities and Lifeline Facilities Located in the 0.2-Percent Annual Chance Flood Event Hazard Area				
Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines	
Brighton (T)	69	65	4	5.8%	4	6.2%	
Brockport (V)	29	28	0	0.0%	0	0.0%	
Chili (T)	111	102	13	11.7%	13	12.7%	
Churchville (V)	24	23	3	12.5%	3	13.0%	
Clarkson (T)	14	10	0	0.0%	0	0.0%	
East Rochester (T/V)	31	29	1	3.2%	1	3.4%	
Fairport (V)	17	16	0	0.0%	0	0.0%	
Gates (T)	58	54	3	5.2%	3	5.6%	





			Number of Critical Facilities and Lifeline Facilities Located in the 0.2-Percent Annu Chance Flood Event Hazard Area			
Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Greece (T)	165	158	7	4.2%	7	4.4%
Hamlin (T)	23	22	0	0.0%	0	0.0%
Henrietta (T)	111	103	4	3.6%	3	2.9%
Hilton (V)	21	20	0	0.0%	0	0.0%
Honeoye Falls (V)	17	16	3	17.6%	3	18.8%
Irondequoit (T)	103	100	0	0.0%	0	0.0%
Mendon (T)	21	20	0	0.0%	0	0.0%
Ogden (T)	42	38	0	0.0%	0	0.0%
Parma (T)	18	16	0	0.0%	0	0.0%
Penfield (T)	73	68	4	5.5%	4	5.9%
Perinton (T)	64	57	2	3.1%	2	3.5%
Pittsford (T)	45	39	2	4.4%	2	5.1%
Pittsford (V)	14	13	0	0.0%	0	0.0%
Riga (T)	20	18	2	10.0%	2	11.1%
Rochester (C)	639	605	11	1.7%	11	1.8%
Rush (T)	29	26	3	10.3%	3	11.5%
Scottsville (V)	14	13	0	0.0%	0	0.0%
Spencerport (V)	13	13	0	0.0%	0	0.0%
Sweden (T)	11	11	1	9.1%	1	9.1%
Webster (T)	55	53	1	1.8%	1	1.9%
Webster (V)	16	15	0	0.0%	0	0.0%
Wheatland (T)	23	21	7	30.4%	7	33.3%
Monroe County (Total)	1,890	1,773	71	3.8%	70	3.9%

Source: Notes: FEMA 2008; Monroe County GIS 2022 C = City; T = Town; V = Village % = Percent

Table 5.4.5-18. Lifelines Exposed to the 1 and 0.2-percent Annual Chance Flood Event Boundary

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Located in the 1-percent Annual Chance Flood Event Hazard Area	Number of Lifelines Located in the 0.2- percent Annual Chance Flood Event Hazard Area
Communications	68	2	2
Energy	14	0	0
Food, Water, Shelter	286	17	23
Hazardous Material	1	0	0
Health and Medical	93	1	2
Safety and Security	1,274	39	42
Transportation	36	0	1
Monroe County (Total)	1,772	59	70





Source: FEMA 2008; Monroe County GIS 2022

In cases where short-term functionality is impacted by a hazard, other facilities of neighboring municipalities may need to increase support response functions during a disaster event. Mitigation planning should consider means to reduce impact on critical facilities and ensure enough emergency and school services remain when a significant event occurs. Actions addressing shared services agreements are included in Section 9 (Jurisdictional Annexes) of this plan.

Impact on Economy

Flood events can significantly impact the local and regional economy. This includes but is not limited to general building stock damages and associated tax loss, impacts on utilities and infrastructure, business interruption, and impacts on tourism. In areas that are directly flooded, renovations of commercial and industrial buildings may be necessary, disrupting associated services. The Impact on General Building Stock subsection above discusses direct impacts on buildings in Monroe County.

Debris management may also be a large expense after a flood event. HAZUS estimates the amount of structural debris generated during a flood event. The model breaks down debris into three categories: (1) finishes (dry wall, insulation, etc.); (2) structural (wood, brick, etc.); and (3) foundations (concrete slab and block, rebar, etc.). These distinctions are necessary because of the different types of equipment needed to handle debris. Table 5.4.5-19. summarizes the Hazus v5.1 countywide debris estimates for the 1-percent annual chance flood event. This table only estimates structural debris generated by flooding and does not include non-structural debris or additional potential damage and debris possibly generated by wind that may be associated with a flood event or storm that causes flooding. Overall, Hazus estimates that there will be 46,819 tons of debris generated during the 1-percent annual chance flood event in Monroe County.

	1-Percent Annual Chance Flood Event					
Jurisdiction	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)		
Brighton (T)	2,767	1,599	647	521		
Brockport (V)	920	748	89	83		
Chili (T)	1,668	1,375	168	125		
Churchville (V)	134	67	39	28		
Clarkson (T)	245	187	30	27		
East Rochester (T/V)	331	114	128	90		
Fairport (V)	606	566	25	16		
Gates (T)	3,087	2,973	70	44		
Greece (T)	2,122	1,662	263	197		
Hamlin (T)	1,332	1,173	93	66		
Henrietta (T)	4,804	3,595	577	631		
Hilton (V)	2,653	739	1,194	720		
Honeoye Falls (V)	461	198	157	106		
Irondequoit (T)	4,409	1,335	1,421	1,653		
Mendon (T)	234	185	28	21		
Ogden (T)	732	412	154	166		
Parma (T)	1,424	1,017	231	176		
Penfield (T)	4,747	1,754	1,567	1,426		
Perinton (T)	1,167	906	153	108		
Pittsford (T)	2,957	1,355	992	610		
Pittsford (V)	76	59	10	7		

Table 5.4.5-19. Estimated Debris Generated from the 1-percent Annual Chance Flood Event





	1-Percent Annual Chance Flood Event					
Jurisdiction	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)		
Riga (T)	148	129	12	7		
Rochester (C)	2,121	496	963	662		
Rush (T)	1,175	464	413	298		
Scottsville (V)	546	221	199	125		
Spencerport (V)	401	150	129	122		
Sweden (T)	205	138	38	29		
Webster (T)	4,168	2,066	1,122	981		
Webster (V)	15	15	0	0		
Wheatland (T)	1,163	641	289	233		
Monroe County (Total)	46,819	26,338	11,202	9,279		

Source: FEMA 2008; HAZUS v5.1

Notes: V = Village, T = Town, C = City

In addition to replacement costs and the cost of debris generated, estimated losses were generated through Hazus for losses of inventory, relocation, buildings, contents, wages, rentals, and income.

Table 5.4.5-20. Estimated Losses for the 1-percent Annual Chance Flood Event

Inventory Loss	Relocation Loss	Building Loss	Content Loss	Wage Loss	Rental Loss	Income Loss
\$22,260,000	\$232,910,000	\$580,820,000	\$1,051,390,000	\$651,950,000	\$133,780,000	\$453,720,000

Source: FEMA 2008; HAZUS v5.1

Impact on the Environment

As Monroe County and its jurisdictions evolve with changes in population and density, flood events may increase in frequency and/or severity as land use changes, more structures are built, and impervious surfaces expand. Furthermore, flood extents for the 1-percent annual chance flood event will continue to evolve alongside natural occurrences such as climate change and/or severe weather events. These flood events will inevitably impact Monroe County's natural and local environment.

Furthermore, the environmental impacts of a dam failure can include significant water quality and debrisdisposal issues. Flood waters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate residential and commercial buildings and the flooded waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals get added to flood waters. Hazardous materials may be released and distributed widely across the floodplain. Water supply and wastewater treatment facilities could be offline for weeks. After the flood waters subside, contaminated and flood-damaged building materials and contents must be properly disposed of. Contaminated sediment must be removed from buildings, yards, and properties. In addition, severe erosion is likely; such erosion can negatively impact local ecosystems.

Cascading Impacts On Other Hazards

Flood events can exacerbate the impacts of land sliding and utility failure. The New York City (NYC) 2019 Hazard Mitigation Plan suggests that flooding may cause a loss of stabilizing plant material caused by inundation and erosion (NYCEM 2019). Flooding of contaminated waters and flood water containing debris may also cause failure of utilities, particularly if the utilities are disrupted by debris clogging treatment systems or flood waters inundating power sources. More information about the landslide hazard of concern can be found in Section 5.4.8.





Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Section 4 identifies areas targeted for future growth and development across the County. Any areas of growth located in the special flood hazard area could be potentially impacted by flooding. Areas outside of the special flood hazard can also be impacted by urban flooding and less frequent and more severe flooding events. Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of population can impact the number of persons exposed to erosion. As forests continue to be cleared for new development and run-off persists, the population in the County will remain exposed to this hazard. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

Climate is defined not simply as average temperature and precipitation but also by the type, frequency, and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of events that exacerbate coastal erosion. While predicting changes of coastal erosion under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society, and the environment (US EPA 2009). Warmer temperatures may lead to an increase in frequency of storms, thus leading to more weather events with potentially increased severity, that cause erosion.

Change of Vulnerability Since 2017 HMP

Monroe County continues to be vulnerable to the flood hazard. However, there are several differences between the exposure estimates of this plan update and the results reported in the 2017 HMP. Updated population statistics and building stock was used in the current risk assessment. Further, exposure for both the population and critical facilities was analyzed. These updated datasets provide a more accurate exposure analysis to the coastal erosion hazard.





5.4.6 HAZARDOUS MATERIALS

This section provides a profile and vulnerability assessment of the hazardous materials hazard for Monroe County.

5.4.6.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the hazardous materials (HazMat) hazard.

Hazard Description

HazMat are substances considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (US EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund Law). This law created a tax on the chemical and petroleum industries and provided federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment (U.S. EPA 2022). There are about 800 CERCLA hazardous materials. Additionally, there are approximately 1,500 known radionuclides, approximately 760 of which are listed individually (U.S. EPA 2022).

Hazardous substance as defined by section 101(14) of CERCLA includes the following:

- Any substance designated pursuant to section 311(b)(2)(A) of the Federal Water Pollution Control Act (33 U.S.C 1215 et esq.) (U.S. EPA 2022);
- Any element, compound, mixture, solution, or substance designated as hazardous under section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA);
- Any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (42 U.S.C. 6801 et esq.) (but not including any waste the regulations of which under the Solid Waste Disposal Act has been suspended by Act of Congress) (U.S. EPA 2022).
- Any toxic pollutant listed under section 307(a) of the Federal Water Pollution Control Act (U.S. EPA 2022);
- Any hazardous air pollutant listed under section 112 of the Clean Air Act (<u>42 U.S.C. 7401</u> et seq.); and
- Any imminently hazardous chemical substance or mixture with respect to which the Administrator of EPA (Administrator) has taken action pursuant to section 7 of the Toxic Substances Control Act (<u>15</u> U.S.C. <u>2601</u> *et seq.*). The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under paragraphs (1) through (6) of this definition, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas) (U.S. EPA 2022).

Numerous facilities throughout Monroe County use and store HazMat as defined by US EPA. Many products containing HazMat are used and stored in homes, and these products are shipped daily on highways, railroads, waterways, and pipelines. If released or misused, HazMat can cause death, serious injury, long-lasting health effects, and damage to structures and other properties, as well as to the environment.

Transportation of HazMat on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazardous substance release incidents. The Monroe County Department of Transportation is responsible for approximately 1,500 lane miles of county-owned highways, 180 bridges, and 275 major culverts (Monroe County 2022). These roads cross rivers and streams at many points; hazardous substance spills on roads





could pollute watersheds that serve as domestic water supplies for areas within Monroe County and other parts of the State. Hazardous substance releases also could occur along rail lines, as collisions and derailments of train cars can result in large spills.

Pipelines transport hazardous liquids and flammable substances such as natural gas and petroleum. If these pipes are corroded, hazardous substances releases could occur when the pipes are damaged during excavation, incorrect operation, or by other forces. When HazMat are transported by aircraft or by watercraft, crashes, spills of materials, or fires on these vessels can pose hazards.

Nuclear power generating stations, research reactors, or other stationary sources of radioactivity present the threat of release of radiological material. This type of event could threaten a large, multi-jurisdictional area, and result in property damage, contamination of farm and water supplies, and economic damage.

Location

The following information pertains to locations of hazardous substances incidents.

Hazardous Materials Fixed Site

A fixed-site hazardous substance (materials and waste) incident is the uncontrolled release of materials from a fixed site, capable of posing a risk to health, safety, and property as determined by the Resource Conservation Recovery Act (RCRA). It is possible to identify and prepare for a fixed-site incident because federal and state laws require those facilities to notify state and local authorities about the materials being used or produced at the site. Hazardous materials at fixed sites are regulated by the EPA.

The EPA chooses to specifically list substances as hazardous and extremely hazardous, rather than providing objective definitions. Hazardous substances (as listed) are generally materials that, if released into the environment, tend to persist for long periods and pose long-term health hazards for living organisms. Extremely hazardous substances, while also generally toxic materials, represent acute health hazards that, when released, are immediately dangerous to the lives of humans and animals and cause serious damage to the environment. When facilities contain these materials in quantities at or above the threshold planning quantity (TPQ), they must submit "Tier II" information to appropriate state and/or local agencies to facilitate emergency planning.

More than 300 fixed facilities use or store HazMat in Monroe County. For security purposes, they are not mapped in this profile.

Superfund is a program administered by the US EPA to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. Data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicates that no Superfund sites are present in Monroe County (U.S. EPA 2022).

Hazard Materials In-Transit

As defined in regulations by the U.S. Department of Transportation (DOT) Materials Transport, a hazardous materials transportation incident is any event resulting in an uncontrolled release of materials during transport that can pose a risk to health, safety, and property. Transportation incidents are difficult to prepare for because there is little, if any, notice about the types of materials involved should an accident happen.

Hazardous materials transportation incidents can occur anywhere within the United States. Transportation of hazardous materials on highways involves tanker trucks or trailers, and these are responsible for the greatest number of hazardous substance release incidents. Potential also exists for hazardous substance releases to occur

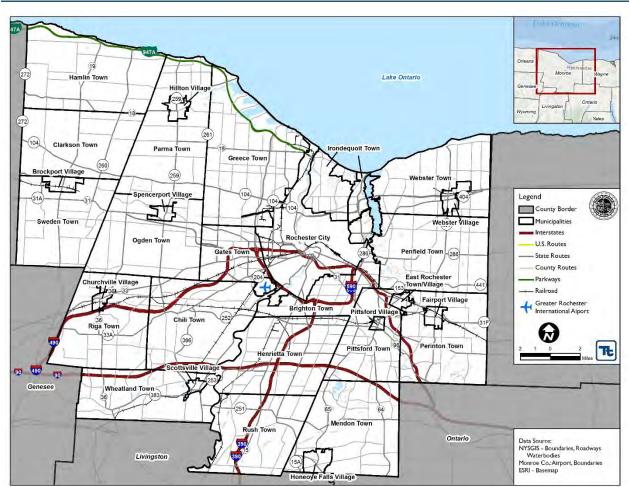




along rail lines, as collisions and derailments of train cars can result in large spills. Hazardous materials in transit are regulated by DOT.

Incidents involving HazMat in transit can occur anywhere in Monroe County. Transportation corridors within Monroe County that carry HazMat include highways, railroads, air/flight paths, pipelines, and navigable waterways. Major highways are more likely to be settings for this type of hazard because of interstate and local commercial transport of HazMat. Transport vehicles do not typically travel through residential areas unless en route to destinations such as a gasoline service station or storage facility

Major transportation routes through Monroe County include Interstate Routes 90, 490, 590, 390, and 531 (see Figure 5.4.6-1 below); and navigable waterways including the Erie Canal and Lake Ontario. Potential for a spill also exists on routes used for industry/business purposes. Section 4 discusses roadways in the County.





Source: Monroe County 2017 HMP

HazMat incidents may occur along railways in Monroe County. Rail lines that may carry HazMat include the CSX (railroad) east-west corridor, and Rochester & Southern (railroad) north-south corridor. The New York Department of Transportation (NYDOT) has a vital interest in preserving and improving the rail freight part of its transportation network. Rail shipments allow cost-effective movement of goods and thus decrease stress on the State's highway system. Major commodities shipped by rail include petrochemicals (including plastic pellets), construction materials, food products, raw materials, and finished goods for manufacturers. Rail cars





carrying HazMat are of concern because an accident or release could pose a public safety hazard to the community.

HazMat can also be transported via underground petroleum and gas (natural and propane) pipelines across the State. New York has an extensive network of natural gas and petroleum pipelines, at least one of which passes through Monroe County. Figure 5.4.6-2 shows extent and location of pipelines throughout western New York state and Pennsylvania, with Monroe County's general area indicated by the red oval.





 Source:
 National Fuel Gas Company 2020

 Note:
 The red oval represents the approximate location of Monore County

Radiological

The threat of a radiological event at a fixed facility is always a possibility because of proximity of the Ginna Nuclear Power Station in Wayne County to the northeastern border of Monroe County. For commercial reactors, areas of risk from exposure to radiation releases are designated as (1) within the Plume Exposure Emergency Planning Zone (EPZ) of such sites (within a 10-mile radius of a site) for direct exposure, or (2) within the Ingestion Pathway Emergency Planning Zone (within a 50-mile radius of a nuclear site) for exposure via the food chain. A credible worst-case event of a radioactive release from a fixed site could affect a large region around the nuclear power site.

The federal EPZ and its 10-mile radius overlay portions of the towns of Webster and Penfield, and the Village of Webster. The 10-mile EPZ is sectored into Emergency Response Planning Areas (ERPA) for Emergency Management purposes. In coordination with New York State, and as tested by the Federal Emergency Management Agency (FEMA), Monroe and Wayne County plans address public alerting and notification,

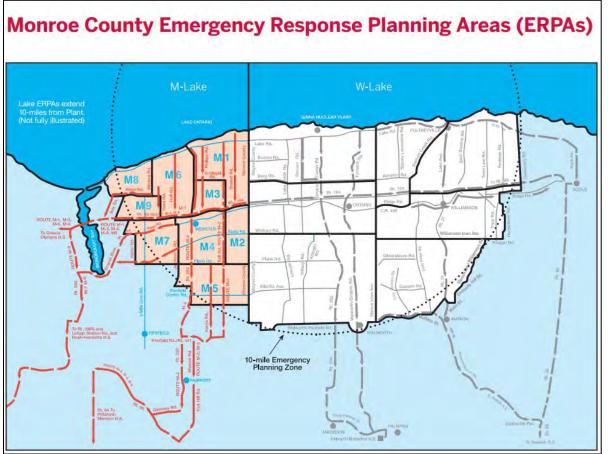




emergency response, special need populations, evacuation routes, detection and monitoring, decontamination, and public health among other topics. The Monroe County Radiological Emergency Preparedness Plan and community Public Safety providers are annually tested on their readiness and response (Constellation Energy Corporation 2022).

Substantial safety features and security measures are in place at the Ginna Nuclear Power Station. Figure 5.4.6-3 below displays the Monroe County Emergency Response Planning Areas (ERPAs).





Source: Constellation Energy Corporation 2022

Extent

The extent of a hazardous substance release depends on (1) whether the substance is released from a fixed or mobile source, (2) the size of the impacted area, (3) the toxicity and properties of the substance, (4) the duration of the release, and (5) environmental conditions (for example, wind and precipitation, terrain, etc.).

Hazardous substance releases can contaminate air, water, and soils, possibly resulting in death and/or injuries. Dispersion can occur rapidly when the hazardous substance is transported by water and wind. While often accidental, releases can occur because of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. HazMat can include toxic chemicals, radioactive substances, infectious substances, and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.





Severity or impact of a hazardous substance release, whether accidental or intentional, depends on several potentially mitigating or exacerbating circumstances. Mitigation involves precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. For example, primary and secondary containment or shielding by implementation of sheltering-in-place protects people and property from the harmful effects of a hazardous substance release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous substance release, include the following:

- Weather conditions, which affect how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain, which alter dispersion of HazMat in compliance with applicable codes (such as building or fire codes)
- Maintenance failures (such as fire protection and containment features), which can substantially increase damage to a facility and to surrounding buildings.

The severity of an incident depends not only on the circumstances described above, but also on the type of substance released and the distance from the incident and related response time of emergency response teams. Areas closest to a release are generally at greatest risk; however, depending on the substance, a release can travel great distances or remain present in the environment for a long period of time (for example, centuries to millennia).

According to the 2022 Monroe County HazMat Response Plan, there are four main classifications of HazMat incidents:

- "Level 0" incident is not likely to adversely impact or threaten life, health, property, or the environment; control of the incident is within the capabilities of resources available to the local response jurisdictions.
- "Level 1" incident may adversely impact or threaten life, health, property or the environment within an area immediately surrounding the point of release or potential release; control of the incident is within the capabilities of the resources locally available to responders in Monroe County.
- "Level 2" incident may adversely impact or threaten life, health, property or the environment beyond the point of release; incident may be across municipal jurisdictions; control of the incident is within the capabilities of the resources based within Monroe County.
- "Level 3" incident is likely to adversely impact or threaten life, health, property, or the environment in a large geographic area. Additional resources are required to supplement those available within Monroe County (Office of Emergency Management 2022).

The occurrence of a hazardous materials incident can be sudden and without any warning, such an explosion, or may slowly develop, as in the case of a leaking container for example. Facilities that store extremely hazardous substances are required to notify local officials when an incident occurs. Local emergency responders and emergency management officials would determine whether they need to evacuate the public or to advise to shelter in place. Similar to on-site hazardous substances incidents, the amount of warning time for incidents associated with hazardous substances in transit varies based on the nature and scope of the incident. If an explosion did not occur immediately following an accident, officials may have time to warn adjacent neighborhoods and facilitate appropriate protective actions.

The north-central region of Monroe County is closest to the Ginna facility, and some areas fall within the prescribed 10-mile EPZ or evacuation area. Additionally, all Monroe County jurisdictions are within the 50-mile ingestion exposure pathway, and could receive deposits of radioactive particles on crops, bodies of water, and ground surfaces, rendering local agricultural harvest unusable for consumption by either humans or livestock.





Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with hazardous material releases throughout New York State and Monroe County; therefore, the loss and impact information for many events varies depending on the source. The accuracy of monetary figures discussed is based on the available information in cited sources.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State was included in two FEMA declared hazardous material specific emergency declarations (EM). Typically, EMs cover a wide region of an included state, and therefore could impact many counties within that state. However, not all counties in New York State were included in the two EMs cited above. Importantly, Monroe County was not included in either EM.

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was not included in any USDA-designated agricultural disasters that included hazardous materials events.

Previous Events

Table 5.4.6-1 identifies the known hazardous materials events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.6-1. Hazardous Material Releases in Monroe County, 2015 to 2022

Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
April 10, 2015	Chemical	N/A	N/A	Town of Henrietta	A combination of cleaning chemicals produced an odor and fog resulting in a HazMat situation at the Henrietta Holiday Inn.
July 24, 2016	Chemical	N/A	N/A	Village of East Rochester	Police responded to a Level 1 HazMat situation in the Village of East Rochester.
August 13, 2016	Fuel/Oil/Gas	N/A	N/A	City of Rochester	A gasoline leak from a vehicle in a lower-level maintenance shop was found causes the evacuation at Senior Home in the City of Rochester.
March 5, 2017	Fuel/Oil/Gas	N/A	N/A	City of Rochester	A car crashes into building in Culver Road and Norton Street area in the City of Rochester, resulting in the disconnection of a gas main that feeds into the building.
July 7, 2017	Fuel/Oil/Gas	N/A	N/A	Town of Perinton	A natural gas operated garbage truck was stuck underneath the Baird Road Bridge in the Town of Perinton. When the truck hit the bridge, it crushed the gas tanks, and caused the natural gas to leak.
September 26, 2017	Chemical	N/A	N/A	City of Rochester	Five gallons of an unknown chemical were poured down the drain of an unoccupied building at Emerson Street in the City of Rochester.
November 1, 2017	Fuel/Oil/Gas	N/A	N/A	Town of Perinton	A wrong-way driver caused a crash that closed I-490 overnight in the Town of Perinton. The crash resulted in thirty to forty gallons of gasoline to leak onto the I-490, deeming a Level 0 HazMat situation.
February 28, 2018	Fuel/Oil/Gas	N/A	N/A	Town of Chili	During construction a gas line was punctured, resulting in a gas leak and a closure of the adjacent plaza in the Town of Chili.
March 13, 2018	Fuel/Oil/Gas	N/A	N/A	City of Rochester	A tractor-trailer crash resulted in downed powerlines in the City of Rochester. The tractor-trailer began leaking diesel fuel in the roadway and firefighters need to apply suppression to the diesel fumes to clear crash site.
June 11, 2018	Fuel/Oil/Gas	N/A	N/A	Town of Wheatland	A collision occurred between a fuel tanker carrying 1,000 gallons of gas and 800 gallons of diesel fuel collided with a van in the Town of Wheatland. HazMat crews responded to the crash for necessary precautions.
December 12, 2018	Chemical	N/A	N/A	City of Rochester	A leak of chlorine gas outside a City of Rochester chemical plant sparked a fire and hazmat response.
August 29, 2019	Chemical	N/A	N/A	City of Rochester	A resident of a high rise building on Van Auker Street in the City of Rochester microwaved a hot pepper causing other residents trouble breathing. The hot pepper released the chemical capsaicin as a result of being microwaved.
May 3, 2020	Fuel/Oil/Gas	N/A	N/A	City of Rochester	Several buildings on East Main Street in the City of Rochester had to be evacuated due to a gas leak.

Source: NOAA-NCEI 2022; FEMA 2022; Global Incident Map 2022





Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to increase. The impacts related to increasing temperatures and sea level rise are already causing complications in the state. *ClimAID: The Integrated Assessment for Effective Climate Change in New York State (ClimAID)* was undertaken to provide decision-makers with information on the state's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2011/2014).

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2–3.4 °F by the 2020s, 4.1–6.8 °F by the 2050s, and 5.3–10.1 °F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the state (NYSERDA 2011/2014).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1 (Western New York and the Great Lake Plains), where temperatures are estimated to increase by 4.3 to 6.3°F by the 2050s and 5.7 to 9.6°F by the 2080s (baseline of 47.7°F, middle range projection). Precipitation totals are estimated to increase between four to ten percent by the 2050s and four to thirteen percent by the 2080s (baseline of 34.0 inches, middle range projection). Table 5.4.6-2. displays the projected seasonal precipitation change for the region (NYSERDA 2011/2014).

Table 5.4.6-2. Projected Seasonal Precipitation Change in Region 1, 2050s (% change)

	Winter	Spring	Summer	Fall
	+5 to +15	0 to +15	-10 to +10	-5 to +10
Sourcou	NVCEDDA 201A		•	

Source: NYSERDA 2014

Non-natural incidents such as hazardous substance incidents are not typically considered vulnerable to climate change; however, climate change may have some impact. Climate change and its impact on hazardous materials sites, particularly waste sites, is a growing concern. According to the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) State Climate Summaries for New York State, the mean annual temperature has increased approximately 2 °F. This temperature change is likely to indirectly affect the County's vulnerability to hazmat incidents.

As temperatures change, excessive heat on aging structures and/or infrastructure may be adversely affected. Excessive heat on structures or containing hazardous materials may alter the material properties.

In addition, hazardous substances stored at fixed locations in the floodplain may experience an increase in flood events due to the projected changes in increased precipitation events, specifically related to magnitude and frequency. Hazardous waste sites near rivers are tentatively at highest risk because extreme storms and higher water levels could release pollution into the environment. Many of these sites were built in locations believed to be removed from potential contamination or exposure-increasing factors. However, development, floodplain boundary change, and an increase in extreme events from climate change are increasing the possibility that water may reach hazardous material and waste sites.

Probability of Future Occurrences

Predicting future hazardous substance incidents in Monroe County is difficult. These can occur at anytime and anywhere in the County. Incidents can occur suddenly without any warning or develop slowly. Small spills, both fixed site and in transit, occur throughout the year, and probability of occurrences of these events is high. Risk of a major incident within a given year is small.





In Section 5.3, the identified hazards of concern within Monroe County were ranked. Probability of occurrence, or likelihood of an event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, probability of occurrence of HazMat spills within the County is considered "rare" (Between 1 and 10 percent annual probability of a hazard event occurring., as presented in Table 5.3-1).

The County is expected to continue to undergo direct and indirect impacts of hazardous substance incidents annually that may induce secondary hazards such as infrastructure deterioration or failure, potential decreases in water quality and supply, and transportation delays, accidents, and inconveniences.

5.4.6.2 Vulnerability Assessment

A qualitative assessment was conducted for hazardous material incidents in Monroe County. The following discusses the County's vulnerability to this hazard. Refer to Section 5.1 (Methodology and Tools) for additional details on the methodology used to assess the hazardous materials risk.

Impact on Life, Health and Safety

Hazardous material incidents have the potential to compromise the health and safety of those living and working in the area of the incident. Specific impacts vary according to the type of material released, the area affected, and the population within the affected area.

A chemical incident may also include an explosion, with additional injuries and deaths being caused by the pressure wave from the explosion. Biological incidents effects on the population depend on the nature of the agent involved, transmissibility, at-risk populations, incubation period, time before detection, and other factors. Biological agents may cause disease from which some individuals will recover while others will not. Radioactive materials can cause significant health effects in individuals, especially if the materials are taken into the body. Radiological incidents that result in the release of radioactive materials from a nuclear power plant can contaminate sources of potable water, livestock, and crops, leading to a dramatically reduced local food supply. Large chemical incidents, and radiological incidents that result in the release of radioactive materials contaminate sources of potable water, crops, and livestock, leading to a reduced local food supply.

Depending on the type and quantity of chemicals released and weather conditions, an incident can affect larger areas that cross jurisdictional boundaries. When HazMat are released into the air or water, or on land, they may contaminate the environment and pose greater danger to human health. The general population may be exposed to a HazMat release through inhalation, ingestion, or dermal exposure. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination. HazMat incidents can lead to injury, illnesses, and/or death of involved persons and those living within the impacted areas.

Locations of these different HazMat and wastes sites in Monroe County render the entire County vulnerable to these hazards. Populations particularly vulnerable to effects of HazMat incidents are along major transportation routes, because significant quantities of chemicals are transported along these major thoroughfares.

Impact on General Building Stock

Potential losses of general building stock caused by a HazMat incident are difficult to quantify. Extent of damage to the general building stock depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination, and/or potential structural and content losses if an explosion occurs.





Impact on Critical Facilities

Potential losses of critical facilities caused by a HazMat incident are difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination, and/or potential structural and content losses if an explosion occurs. If the operators at a critical piece of infrastructure, such as a power plant, were unavailable, there could be physical damages to the infrastructure itself. Refer to Section 4 (County Profile), which summarizes the number and type of critical facilities in Monroe County.

Impact on Economy

If a significant HazMat incident occurs, not only would life, safety, and building stock be at risk, but the economy of Monroe County would be affected as well. A significant incident within an urban area may force businesses to close for an extended period of time because of contamination or direct damage caused by an explosion, if one occurred. Exact impacts on the economy are difficult to predict, given the uncertainty of sizes and scopes of incidents.

HazMat incidents can lead to closures of major transportation routes in Monroe County. Closures of waterways, railroads, airports, and highways because of these incidents can hinder delivery of goods and services. Potential impacts may be local, regional, or statewide, depending on the magnitude of the event and the extent of disruptions to services.

Radiological contamination of agriculture, livestock, and production can lead to loss of commerce with other regions of the State, country, and even the world. Certain chemicals and hazardous materials can be toxic to plants and animals, damaging their habitats and food sources. Radioactive materials released into the environment could enter the food chain and ultimately contaminate the human food supply. Nuclear impacts on the environment are similar to that of radioactive materials; however, the extent of impacts can be larger due to the amount of miles it can impact (NYC 2019).

Impact on the Environment

Certain chemicals and hazardous materials can be toxic to plants and animals, damaging their habitats and food sources. Radioactive materials released into the environment could enter the food chain and ultimately contaminate the human food supply. Nuclear impacts on the environment are similar to that of radioactive materials; however, the extent of impacts can be larger due to the amount of miles it can impact (NYC 2019).

Wastes that get into waterways will be disruptive and sometimes deadly to aquatic species. Consequentially, wastes that get into waterways can also contaminate drinking water supplies. Hazardous wastes can also leach into soils and travel with wind, which not only impacts the local habitat, but can create issues for surrounding communities. Strict disposal regulations have been defined by organizations like EPA to ensure that the environment and community is protected from these types of events.

Cascading Impacts On Other Hazards

Hazardous material incidents can cause utility failure. If an explosion or contamination occurred, water quality and supply could stop or drastically decrease.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:





- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Any areas of growth could be potentially impacted by the hazardous materials hazard. Development near the transit routes for hazardous materials and facilities will increase the County's overall risk. Therefore, the County should take precautions when determining the location of new development to consider the development's proximity to hazardous material facilities and transit routes. The County may also want to consider implementing designs into the new development that enable improved evacuation or protection from residual impacts from the hazardous materials. Section 4, County Profile, includes more information about the county's anticipated and recent new development plans.

Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Any changes in the density of population can impact the number of persons living near hazardous materials facilities, transit routes, and pipelines. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

As temperatures change, excessive heat on hazardous materials containers may alter the properties of the material. In addition, fixed hazmat storage locations in the floodplain may experience an increase in flood events due to the projected changes in increased precipitation events, such as changes in magnitude and frequency.

Change of Vulnerability Since 2017 HMP

This vulnerability assessment uses updated data where applicable to provide a better understanding of the potential impacts caused by hazardous materials.





5.4.7 Infestation and Invasive Species

This section provides a profile and vulnerability assessment of the infestation and invasive species hazard for Monroe County.

5.4.7.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the infestation and invasive species hazard. Lyme disease and West Nile Virus caused by ticks and mosquitos are discussed in Section 5.4.1 – Disease Outbreak.

Hazard Description

An infestation is defined as an invasion or overrun by parasites that attack plants, animals, and humans. Insect, fungi, and parasitic infestations can result in destruction of various natural habitats and cropland, impact human health, and cause disease and death among native plants, wildlife, and livestock. An infestation is the presence of pest organisms within an area or field, on the surface of a host, or in soil at numbers or quantities large enough to harm, threaten, or otherwise negatively affect native plants, animals, and humans. Pests are any organisms (insects, mammals, birds, parasite/pathogen, fungi, non-native species) that threaten other living species within an environment. Pests compete for natural resources and can transmit diseases to humans, crops, and livestock. Human populations are generally affected by insect or animal infestations that can lead to epidemics or endemics.

Invasive species are non-native species that can harm the environment, the economy, or human health. They may come from anywhere in the world, and as international trade increases, so does the rate of invasive species introductions. Invasive species threaten nearly every aspect of the world and are one of the greatest threats to New York State's biodiversity (NYSDEC n.d.). They can cause or contribute to the following:

- Habitat degradation and loss
- Loss of native fish, wildlife, and tree species
- Loss of recreational opportunities and income
- Crop damage, and diseases in humans and livestock (NYSDEC n.d.)

Thousands of species have been introduced into the United States, posing serious threats to agriculture, human health, and the integrity of land and water. New York State and Monroe County are vulnerable to damage from these invasive species. The following are names of invasive species found in New York State; however, this list does not include all plant species that are invasive or potentially invasive within the state.

- Amur Cork Tree
- Amur Honeysuckle
- Autumn Olive
- Beach Vitex
- Black Locust
- Black Swallow-wort
- Border Privet
- Brazilian Waterweed
- Broad-leaf Pepper grass

- Broadleaf Water milfoil
- Canada Thistle
- Carolina Fanwort
- Chinese Lespedeza
- Chinese Sliver Grass Chinese Lespedeza
- Chinese Sliver Grass
- Chinese Yam
- Cogon Grass
- Common Buckthorn

- Common Frogbit
- Cup-plant
- Curly Pondweed
- Cut-leaf Teasel
- Cypress Spurge
- Eurasian Water milfoil
- European Common Reed Grass
- Floating Primrose Willow



- Garden Loosestrife
- Garlic Mustard
- Giant Hogweed
- Japanese Angelica
- Tree
- Japanese Barberry
- Japanese Honeysuckle
- Japanese Hops
- Japanese Knotweed
- Japanese Stilt Grass
- Japanese Virgin's bower
- Kudzu
- Leafy Spurge
- Lesser Celandine
- Marsh Dewflower

- Mile-a-minute Weed
- Morrow's
- Honeysuckle
- Mugwort
- Multiflora Rose
- Narrowleaf Bittercress
- Norway Maple
- Oriental Bittersweet
- Pale Swallow-wort
- Parrot-feather
- Porcelain Berry
- Purple Loosestrife
- Reed Canary-grass
- Rock Snot (diatom)
- Rusty Willow
- Slender False Brome

- Small Carpgrass
- Smooth Buckthorn
- Spotted Knapweed
- Sycamore Maple
- Tall Glyceria
- Uruguayan
 Primrosewillow
- Water Chestnut
- Water thyme
- Wavyleaf Basketgrass
- Wild Chervil
- what Chervi
- Wineberry
- Winged Euonymus
- Winter Creeper
- Yellow Floating Heart
- Yellow Iris

The Finger Lakes Partnership for Regional Invasive Species Management (PRISM) is a cooperative partnership of diverse stakeholders from throughout the central region of New York State, including Monroe County. According to the Finger Lakes PRISM agricultural working group, the priority invasive plant species of concern in the region include Autumn and Russian olive, Canada thistle, Field bindweed, Japanese knotweed, Johnson grass, Ragweed, Spotted knapweed, Swallow-wort, Velvet leaf, and Wild parsnip for plants; Basil downy mildew (*Peronospora belbahrii*), Grape crown gall (*Agrobacterium tumefaciens*), Late blight (*Phytophthora infestans*), Phytophthora blight (*Phytophthora capsici*), and Plum pox virus (Potyvirus) for diseases; and BMSB (*Halyomorpha halys*), Garlic bloat nematode (*Ditylenchus dipsaci*), Golden nematode (*Globodera rostochiensis* - not an insect but should be included), Spotted wing drosophila (*Drosophila suzukii*), and Swede Midge (Contarinia nasturtii) for insects. Aquatic species of concern include the macrophytes Hydrilla and *Trapa natans* (water chestnut); macroalgae *Nitellopsis obtuse* (starry stonewort); invertebrates *Corbicula fluminea* (Asian clam) and *hemimysis* (bloody red shrimp); and the fish *Neogobius melanostomus* (round goby) (New York Invasive Species (IS) Information 2022).

New York State has been impacted by various past and present infestations, including high populations of mosquitoes, which can cause West Nile Virus (WNV); deer ticks, which can cause Lyme disease; and Asian longhorned beetles and hemlock woolly adelgid, which destroy trees. Other infestations that have affected the state include Eastern Equine Encephalitis, La Crosse Encephalitis, Powassan Virus, St. Louis Encephalitis, Western Equine Encephalitis, Emerald Ash Borer, and Sirex Woodwasp. Not all of these infestations have occurred in Monroe County. The infestations listed below merit attention.

Black Swallow-Wort, also known as *Cynanchum louiseae*, is a weed in the shape of a V and resembles a swallow's tail. The invasive plant has been found in gardens and parks throughout Monroe County.

Brown Marmorated Stink Bug (BMSB) is an invasive species that is native to Eastern Asia and was first detected in Pennsylvania in October 2001. The insect has spread across a number of eastern U.S. states, and its presence has now been documented in Oregon and California as well. These insects can be an agricultural pest, threatening apples, pears, peaches, figs, mulberries, citrus, persimmons, and soybeans (Cornell Cooperative Experience 2019). Severe damage from these insects can render crops unusable for processed products.





Emerald Ash Borer (EAB) is an invasive beetle from Asia and kills North American ash species (*Fraxinus* sp.), all of New York's ash trees are susceptible to EAB. The first EAB infestation in New York State was discovered in Cattaraugus County 2009. As of the summer of 2022, the presence of EAB has been confirmed in all New York counties except; Essex, Hamilton, and Lewis (NYSDEC 2021). The EAB is a small and very destructive beetle. It has four stages: adult, egg, larva, and pupa. The adult beetle are roughly 3/8 to 5/8 inch long with metallic green wing covers and a coppery red or purple abdomen. They may be present from late May through early September but are most common in June and July. Signs of infection include tree canopy dieback, yellowing, and browning of leaves (NYSDEC 2021).

Hemlock Woolly Adelgid (HWA) came to the U.S. from southern Japan and has been present in New York State since the 1980s, where it most likely arrived on infested nursery stock that was sold and distributed near New York City and the Lower Hudson region, and in 2008 the HWA was first found in the Finger Lakes Region (Cornell Cooperative Experience 2019). The adelgid uses long mouth parts to extract sap and nutrients from hemlock foliage, preventing free growth and causing needles to discolor from deep green to grayish green and to drop prematurely. Loss of new shoots and needles seriously impairs tree health. Infestation is usually fatal to the tree after several years. Wind, birds, other wildlife, and movement of infested host material (wood) by humans are all factors in dispersion of the adelgid (NYSDEC 2018). Hemlock wood is commonly used in barns and on farm building projects. Groves of hemlock groves can result in loss of cool, damp, and shaded microclimate that supports terrestrial plant communities. Losses can also result in warmer stream temperatures for fish and other aquatic species, thus harming them.

Spotted Lanternfly is a planthopper native to China and Southeastern Asia. Spotted lanternfly is a significant economic and lifestyle pest for residents, businesses, tourism, forestry, and agriculture. The greatest agricultural concern falls on grapes, hops, apples, blueberries, and stone fruits. Its presence has led to crop loss, exporting issues, and increased management costs (New York State Integrated Pest Management 2022a).

True Armyworm, also known as the common armyworm, is primarily a pest of plants in the grass family: forage/ pasture/ grasses and lawns, small grains, and corn. However, under distress, armyworms will also attack legumes and other plants. Young larvae appear smooth, cylindrical, pale green to brownish, while mature larvae are smooth and marked with two orange, white-bordered strips on each side. Larvae range in size from 1/8 inch to 1 ½ inches long. The insect spends winters in the south and flies up to New York State in the spring (Cornell Cooperative Extension 2021).

Regulations

The Invasive Species Council (Council) is a statutory body that was created in 2008 by Title 17, Section 9 of the Environmental Conservation Law (ECL). The Council was created to coordinate among multiple State entities and partners in addressing the environmental and economic threats of invasive species. The legislation defines invasive species as "a species that is (a) non-native to the ecosystem under consideration; and (b) whose introduction causes or is likely to cause economic or environmental harm or harm to human health" (NYSDEC 2022).

The Council is co-led by the Department of Agriculture and Markets (AGM) and consist of nine members: the Commissioners of DEC, AGM, Transportation, Education, and Office of Parks Recreation and Historic Preservation (OPRHP), Secretary of State, the Chairperson of New York State Thruway Authority, the Director of the New York State Canal Corporation, and the Chairperson of the Adirondack Park Agency (APA) (NYSDEC 2022).





As of 2014, New York State has adopted regulations (6 New York Codes Rules and Regulations [NYCRR] Part 575) which identifies the regulations standards for selling and offering regulated species. Any persons who purchase a regulated invasive species is required to maintain all labels, signs and notices pertaining to invasive species in the given areas (New York Codes, Rules, and Regulations 2022).

Extent and Location

The extent and location of an infestation or invasive species depend on the preferred habitat of the species, as well as the species' ease of movement and establishment. Each threat can impact most areas of New York State, including Monroe County. Levels of threat from infestations and invasive species range from nuisance to widespread. The threat typically intensifies when the ecosystem or host species is already stressed, such as during periods of drought and increased periods of rainfall.

Black Swallow Wart

Black Swallow-Wort, also known as *Cynanchum louiseae*, is a weed in the shape of a V and resembles a swallow's tail. The invasive plant has been found in gardens and parks throughout Monroe County. In 2014, reports of black swallow-wart were found in all the parks located within the County (Democrat & Chronicle 2014).

Brown Marmorated Stink Bug

Figure 5.4.7-1 below shows the distribution of brown marmorated stink bugs in New York State as of 2022. The red circle identifies Monroe County, where over 500 cases have been reported.

Emerald Ash Borer

The Emerald Ash Borer (EAB) is a very small but very destructive beetle, that has decimated North America's native ash tree population, and is responsible for putting all three of New York's ash species into serious decline (Monroe County Soil & Water Conservation District 2020). Signs of infestation in the tree canopy include dieback, yellowing, and browning of leaves. Monroe County is home to the highest density of ash trees in New York State, leaving a disproportionate impact on the County's parks, forests, and waterways (Monroe County Soil & Water Conservation District 2020). Ash frequently grows along streams, swamps, and lakes, and is key to reducing nutrient runoff and sediment erosion, the Monroe County Soil & Water Conservation District along with Monroe County and New York State Parks planted 21,240 new trees of different species along the waterways in the County where ash typically grew, in hopes to provide the same benefits to water quality, secure the economic and ecological health of water and waterways (Monroe County Soil & Water Conservation District 2020). This initiative was funded through the Great Lakes Restoration Initiative and was completed in 2020.

Hemlock Woolly Adelgid (HWA)

The Hemlock Woolly Adelgid (HWA) is an aphid like insect that threatens hemlock trees in eastern North America. HWA has been in North America for twenty years and has been spreading across New York State and to higher elevations at an alarming rate (Cornell Cooperative Extension 2018). Early detection is the key to successful management, HWA are recognized by white woolly masses produced on twigs in late winter. Figure 5.4.7-2 shows the distribution of HWA in New York State and Monroe County as of January 2020. The dark blue circle indicates Monroe County.





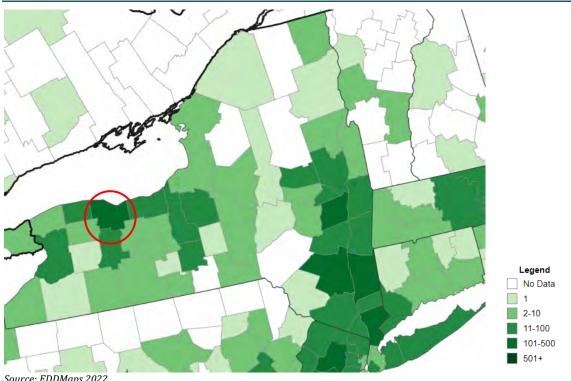
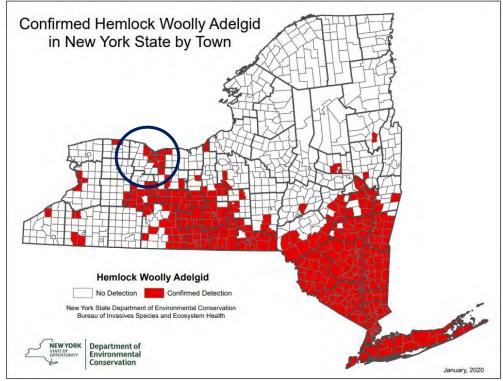


Figure 5.4.7-1 Brown Marmorated Stink Bug Distribution in New York State and Monroe County

Source: EDDMaps 2022 Note: The red circle indicates the position of Monroe County

Figure 5.4.7-2. Confirmed Hemlock Woolly Adelgid in New York State by Town



Source: NYSDEC 2020





Note: The black circle indicates the approximate position of Monroe County

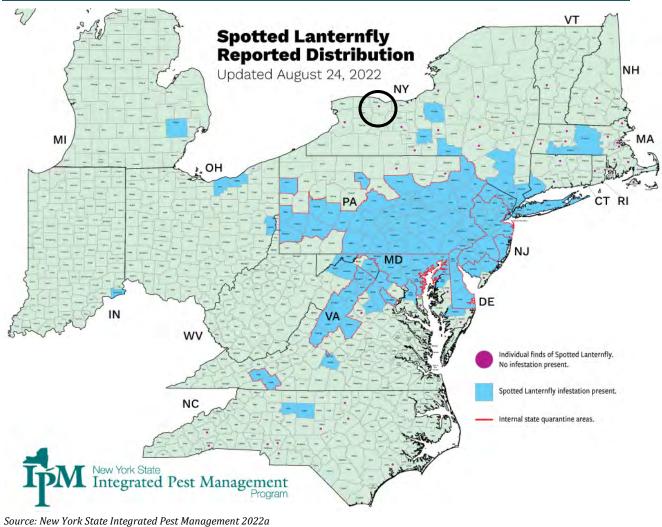
Based on the information presented in the above image, the northeast and southeast portions of Monroe County have the largest detection of HWA.

Spotted Lanternfly

The spotted lanternfly (*Lycorma deliculta*) is an Asian plant hopper. In the USA, spotted lanternfly is an invasive species that could be very devastating to some crops and hardwood trees. This insect was accidentally introduced into Pennsylvania and was confirmed in September 2014. Since this time, the insect has spread throughout the mid-Atlantic (New York State Integrated Pest Management 2022a)

The spotted lanternfly can feed on more than 70 plant species including cultivated grapes, fruit trees, and hardwood trees. Key tree hosts include black walnut; red maple; and agricultural crops such as grapes, hops, apples, and peaches. As of August 2022, spotted lanternfly has been found in Monroe County but has not reached infestation levels yet (New York State Integrated Pest Management 2022a).

Figure 5.4.7-3 Spotted Lanternfly Reported Distribution



Note: The black circle indicates the position of Monroe County





True Armyworm

The True Armyworms are primarily a pest of plants in the grass family: forage, pasture, grasses and lawns, small grain, and corn. This native species does not overwinter in New York but fly north from southern states in the spring. Under hunger stress armyworms will attack legumes, and other plants. Commercial field crops at risk for armyworms; grass or mostly grass hay fields, pastures, corn fields that were late planted into grass fields, no-till or reduced tillage fields, fields with crop residue, planted into small grain (especially rye grass) cover crop, corn fields with grassy weeds, quackgrass, crabgrass and bluegrass and other perennials, small grain fields (Cornell Cooperative Extension 2021).

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with infestations and invasive species throughout New York State and Monroe County; therefore, the loss and impact information for many events varies depending on the source. The accuracy of monetary figures discussed is based on the available information in cited sources.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State and Monroe County were not included in any FEMA declared infestation and invasive species disasters (DR) or emergency declarations (EM). However, Monroe County was included in a West Nile Virus outbreak in 2000. Section 5.4.1 (Disease Outbreak) includes more information on this declaration.

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that included or may have included losses due to infestation and invasive species:

- S4023 2016 Insects
- S4031 2016 Insects
- S4037 2016 Insects

The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are low the following years as well. USDA records indicate that Monroe County has experienced crop losses from infestation and invasive species events. Table 5.4.7-1 provides details regarding crop losses in Monroe County according to USDA records.

Year	Сгор Туре	Cause of Loss	Losses
2015	Soybeans	Wildlife/Invasive Species/Infestation	\$12 thousand
2016	Corn, Soybeans	Wildlife/Invasive Species/Infestation	\$11 thousand
2017	Corn	Wildlife/Invasive Species/Infestation	\$14 thousand
2018	Corn, Soybeans	Wildlife/Invasive Species/Infestation	\$22 thousand
2019	Corn, Soybeans	Wildlife/Invasive Species/Infestation	\$4 thousand

Table 5.4.7-1. USDA Crop Losses from Infestation and Invasive Species in Monroe County (2015-2022)





Year	Сгор Туре	Cause of Loss	Losses
2020	Corn, Soybeans	Wildlife/Invasive Species/Infestation	\$6 thousand
2021	Soybeans	Wildlife/Invasive Species/Infestation	\$2 thousand
2022	Soybeans	Wildlife/Invasive Species/Infestation	\$1 thousand

Source: USDA 2022

Previous Events

No new invasive species have impacted Monroe County since 2015. No infestation events have been identified since 2015. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).

Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to increase. The impacts related to increasing temperatures and sea level rise are already causing complications in the state. *ClimAID: The Integrated Assessment for Effective Climate Change in New York State (ClimAID)* was undertaken to provide decision-makers with information on the state's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2011/2014).

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2–3.4 °F by the 2020s, 4.1–6.8 °F by the 2050s, and 5.3–10.1 °F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the state (NYSERDA 2011/2014).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1 (Western New York and the Great Lake Plains), where temperatures are estimated to increase by 4.3 to 6.3°F by the 2050s and 5.7 to 9.6°F by the 2080s (baseline of 47.7°F, middle range projection). Precipitation totals are estimated to increase between four to ten percent by the 2050s and four to thirteen percent by the 2080s (baseline of 34.0 inches, middle range projection). Table 5.4.7-2 displays the projected seasonal precipitation change for the region (NYSERDA 2011/2014).

Winter	Spring	Summer	Fall
+5 to +15	0 to +15	-10 to +10	-5 to +10

Source: NYSERDA 2014

Temperature and rainfall increases due to climate change are anticipated, and evidence exists that climate change may be a factor in expansion of infestation and infectious diseases in the United States. Warmer temperatures and changing rainfall patterns provide an environment where insects can remain active longer, greatly increasing the risk for animals and humans. The changes in climate can also allow tropical and subtropical insects to move from regions where diseases thrive into new places (Natural Resource Defense Council 2015). Armyworms die in colder temperatures. Warmer spring and winter temperatures allow them to continue to reproduce—a factor contributing to the outbreak in 2012.

As temperatures increase and rainfall patterns change, these insects can remain active for longer seasons and within wider areas. The ability to predict the future distribution of invasive species in response to climate change is a difficult task due to the factors that influence local and short-term invasion patterns, and because invasive species and concurrent climate and land-use changes are dynamically linked (Finch, et al. 2021).





Probability of Future Occurrences

Based on historical documentation and given the overall impact of changing climate, New York State is expected to undergo increased incidences of infestation. Monroe County and all its jurisdictions will continue under threat of infestations that may induce secondary hazards and health threats to the County population if infestations are not prevented, controlled, or eradicated.

In Section 5.3, the identified hazards of concern within Monroe County were ranked. Probability of occurrence, or likelihood of an event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, probability of occurrence of infestation and invasive species within the County is considered "occasional" (Between 10 and 100 percent annual probability of a hazard event occurring., as presented in Table 5.3-1).

5.4.7.2 Vulnerability Assessment

A qualitative assessment was conducted for infestations and invasive species in Monroe County. The following discusses the County's vulnerability to this hazard. Refer to Section 5.1 (Methodology and Tools) for additional details on the methodology used to assess the infestation and invasive species risk.

Impact on Life, Health and Safety

The entire population of Monroe County is vulnerable to infestation. According to the 2020 U.S. Census, Monroe County had a population of 759,443. As discussed earlier, infestations can have an impact on agricultural commodities. This destruction of crop may include consumable resources that are sold to persons in the County. Section 5.4.2 (Drought) discusses the number of farms that are operating in the County (i.e., 527 farms) (USDA 2017). It is reasonable to assume that the farms in Monroe County also experience losses in crops. This not only impacts the livelihood of the farmers; it also affects the community that relies on these crops for food or other commodities.

Impact on General Building Stock

Structures are not anticipated to be directly affected by infestation or invasive species; however, EAB may cause a catastrophic loss of ash trees throughout the County, which could result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly cause foundation issues for nearby structures. Additionally, with an increased number of dead trees, there is an increased risk of trees falling on roadways, power lines, and buildings.

Some invasive plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other invasive plant species have been known to clog culverts and streams, increasing flooding risk.

Impact on Critical Facilities

Water treatment plants could be impacted by infestation and invasive species because of similar issues that the general building stock may experience. Water that becomes polluted due to increased sedimentation and erosion will require additional treatment. If the system becomes clogged with these pollutants, the ability of water treatment plants to operate may become impaired. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.





Impact on Economy

Impacts of infestation and invasive species on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with activities and programs implemented to conduct surveillance and address infestation have not been quantified in available documentation. Crop losses from invasive species may be significant; during 2012, the County's crop was severely impacted by the armyworm. In 2017, there were 85,422 acres of cropland in Monroe County with \$66,638,000 in crops sold (USDA 2017). Therefore, it is reasonable to believe that Monroe County farmers have experienced monetary losses from infestations.

EAB is the responsible for placing all three of New York's ash species in serious decline. Ash wood is the primary wood for baseball bats, the most common tree planted in parks and city streets, and has a long history of positive impact to several wildlife species (Monroe County Soil & Water Conservation District 2020). The cost of removal for ash trees can be upwards of \$1 million depending on the number of trees for removal and their location.

Impact on the Environment

As previously discussed, Monroe County's parks, forests, landscaping, and agricultural areas are vulnerable to spotted lanternfly, HWA, and EAB. Species that cause eventual destabilization of soil, such as invasive insects that destroy plants or invasive plants that outcompete native vegetation but have less effective root systems, can increase runoff into waterbodies. Soil destabilization can also increase the likelihood of mudslides in areas with a steep slope.

Cascading Impacts On Other Hazards

Species that result in damage and death to trees can increase the risk of wildfire. For more information on wildfire, refer to Section 5.4.11. Soil destabilization can also increase the likelihood of mudslides in areas with a steep slope. For more information on landslides, refer to Section 5.4.8.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Section 4 identifies areas targeted for future growth and development across the County. Any areas of growth located within Monroe County could be potentially impacted by invasive species and infestation. Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of population and the increased construction throughout the County could lead to increased infestation of homes and other structures. When building developments locate near wetlands, forested





areas, or agricultural lands, it increases the possibility of infestation. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

Climate change and invasive species are two of the top four drivers of global biodiversity loss, affecting production landscapes, reducing crop yields, and the provision of ecosystem services (Masters and Norgrove 2010). Land use changes because of climate change creates an empty niche for invasive species to occur so together these drivers have a greater impact. Climate change can facilities invasive species and infestation such as new species that become invasive entering regions due to climate change, species hierarchy in ecosystems will begin to shift, leading to new dominants that may portrait invasive behaviors, and climate induced stress in the ecosystem will facilitate invasive ecosystems (Masters and Norgrove 2010). Alternatively, invasive species and infestations can facilitate climate stress by increasing the ecosystems susceptibility to climatic disturbance, through reducing the number of species and their functional types within an ecosystem.

Change of Vulnerability Since 2017 HMP

Overall, the County's vulnerability has not changed since the 2017 HMP, and exposure and vulnerability to infestation and invasive species will continue throughout Monroe County.





5.4.8 LANDSLIDE

This section provides a profile and vulnerability assessment of the landslide hazard for Monroe County.

5.4.8.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the landslide hazard.

Hazard Description

A landslide is the process that results in the downward and outward movement of slope-forming materials (NYS Geological Survey n.d.). Landslide materials can consist of natural rock, soil, artificial fill, or any combination of these materials (NYS DHSES 2014). The materials move by falling, toppling, sliding, spreading, or flowing (NYS Geological Survey n.d.).

Landslides are caused by one or more of the following factors: change in slope of the terrain, increased load on the land, shocks and vibrations, change in water content, groundwater movement, frost action, weathering of rocks, and removing or changing the type of vegetation covering slopes. Landslide hazard areas exist where the land has characteristics that contribute to the risk of the downhill movement of material, such as the following:

- A slope greater than 33 percent
- A history of landslide activity or movement during the last 10,000 years
- Stream or wave activity that has caused erosion, undercut a bank, or cut into a bank to cause the surrounding land to be unstable
- The presence or potential for snow avalanches
- The presence of an alluvial fan, indicating vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel.

Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes caused by construction or erosion, earthquakes, and changes in groundwater levels. Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, developed hillsides, and areas recently burned by forest and brush fires (NYS DHSES 2014). Human activities that contribute to slope failure include altering the natural slope gradient, increasing soil water content, and removing vegetation cover. Warning signs for landslide activity include:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavement, or sidewalk
- Soil moving away from foundations
- Ancillary structures, such as decks and patios, tilting and moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls, or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity
- Sudden increase in creek water levels while rain is still failing or just recently ended
- Sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb





- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together (USGS 2013).

There are several different types of landslides including:

- Rock Falls: blocks of rock that fall away from a bedrock unit without a rotational component
- *Rock Topples:* blocks of rock that fall away from a bedrock unit with a rotational component
- Rotational Slump: blocks of fine grained sediment that rotate and move down slope
- Transitional Slide: sediments that move along a flat surface without a rotational component
- *Earth Flows:* fine-grained sediments that flow downhill and typically form a fan structure
- *Creep:* a slow moving landslide often only noticed through crooked trees and disturbed structures
- *Block Slides:* blocks of rock that slide along a slip plane as a unit down a slope
- *Debris Avalanche:* predominately gravel, cobble, boulder, and sediment portions, and trees that move quickly down slope
- *Debris Flows:* coarse sediments that flow downhill and spread out over relatively flat areas (NYS DHSES 2014)

Location

Landslides have occurred in several areas of Monroe County, often as a result of flooding and erosion along the Lake Ontario shoreline and bluffs. Landslides have also occurred in some of the large open gravel pits. Natural variables such as soil properties, topographic position, and slope contribute to determining the overall risk of the landslide hazard in a given area. Specific areas of the County which have historically been most susceptible include:

- The high-angle slope areas surrounding Irondequoit Bay and the south shore of Lake Ontario, including the houses and businesses and other nearby structures
- Specific areas within Monroe County parks
- Open mine pits.

The underlying cause of a landslide is another significant variable influencing the occurrence of an event. These causes, or triggers, can be natural or human-induced sources. The three most common landslide triggers are water saturation of the ground; loading, or increased weight at the top or high end of the slope; and taking away soil or removing mass from the bottom (NYS DHSES 2014).

256,266 persons in Monroe County live in a moderate incidence area and 323,263 persons live in a moderate susceptibility area (NYS DHSES 2014). Figure 5.4.8-1 shows the landslide incidence and susceptibility in Monroe County based on terrain slopes and soil type throughout the County (Monroe County 2022).





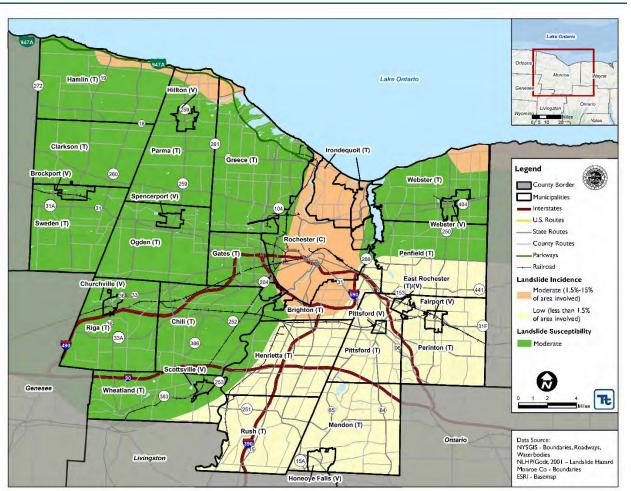


Figure 5.4.8-1. Landslide Incidence and Susceptibility in Monroe County

Source: Monroe County 2022

Extent

The extent of a landslide hazard is determined by identifying the affected areas and assessing the probability of a landslide occurring within a time period. Natural variables that contribute to the overall extent of potential landslide activity in any particular area include soil properties, topographic position and slope, and historical incidence. Predicting a landslide is difficult, even under ideal conditions. As a result, the landslide hazard is often represented by landslide incidence and susceptibility, as defined below.

- Landslide incidence is the number of landslides that have occurred in a given geographic area. High incidence means greater than 15 percent of a given area has been involved in landsliding; medium incidence means that 1.5 to 15 percent of an area has been involved; and low incidence means that less than 1.5 percent of an area has been involved (Radbruch-Hall 1982).
- Landslide susceptibility is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced landslides in the past. Landslide susceptibility depends on slope angle and the geologic material underlying the slope. Landslide susceptibility only identifies areas potentially affected and does not imply a time frame when a landslide might occur. High, medium, and





low susceptibility are delimited by the same percentages used for classifying the incidence of landsliding (Radbruch-Hall 1982).

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with landslides throughout New York State and Monroe County; therefore, the loss and impact information for many events varies depending on the source. The accuracy of monetary figures discussed is based on the available information in cited sources.

Landslides have occurred in several areas within Monroe County, however, none have caused personal injury. High water levels on Lake Ontario caused severe erosion in 1993, 1997, and 1998, and contributed to landslides. Cliffs along the shoreline in the Town of Webster, and along the Irondequoit Bay were eroded. In 1998, severe erosion exposed a sanitary sewage transmission main near Sea Breeze, in the Town of Irondequoit, prompting emergency measures for repair and a call for immediate protective relief from the International Joint Commission that regulates lake levels (NYS DHSES 2014). On April 2, 1997, a house on the west side of Irondequoit Bay slid off its foundation into the bay; however, the cause was unknown. In January, 1998, a basement wall on the uphill side of a home in Webster collapsed from the pressure of saturated soils and downhill drainage. On August 31, 2004, excessive rain saturated a hillside in the Town of Irondequoit and caused brush and dirt to slide 40 feet toward bayside houses known as German Village (more than ten were affected). According to the NYS HMP and other sources reviewed, there has only been one landslide since 2010, occurring in 2020 south of Oakdale (Lacrosse Tribune 2020).

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, FEMA issued one disaster declaration (DR) for landslides in New York State. Generally, these disasters cover a wide region of the state; therefore, they may have impacted many counties. However, not all counties were included in the disaster declaration; Monroe County was not included in this declaration (FEMA 2022).

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that included or may have included losses due to landslides:

- S3885 2015 Excessive Rain, High Winds, Hail, Lightning, and Tornado
- S4274 2017 Excessive Rain and Related Flooding
- S4265 2017 Excessive Rain and Related Flooding, High Winds, and Hail
- S4479 2018 Excessive Rain
- S4622 2019 Excessive Rain, Moisture, Humidity

The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are also low in the following years. USDA records indicate that Monroe County has not experienced crop losses from landslide events.





For this 2022 HMP Update, known landslide events that have impacted Monroe County between 2015 and 2022 are identified in Table 5.4.8-1. However, Table 5.4.8-1 may not include a complete record of all landslide events that have occurred within the County.





Table 5.4.8-1. Landslide Events between 2015 and 2022

Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
August 28, 2020	Landslide	N/A	No	A Monroe County home on Hope Road, south of Oakdale, was damaged by a landslide event.

Sources: Lacrosse Tribune 2020

FEMA Federal Emergency Management Agency

N/A Not applicable





Climate Change Impacts

Providing projections of future climate change for a specific region is challenging. Shorter-term projections are more closely tied to existing trends making longer-term projections even more challenging. The further out a prediction reaches, the more it is subject to change.

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1, Western New York, Great Lakes Plain. In Region 1, it is estimated that temperatures will increase by 3.0 °F to 5.5 °F by the 2050s and 4.5 °F to 8.5 °F by the 2080s (baseline of 48.0 °F, mid-range projection). Precipitation totals will increase between 0 and 10 percent by the 2050s and 0 to 15 percent by the 2080s (baseline of 37.0 inches, mid-range projection). Table 5.4.8-2 displays the projected seasonal precipitation change for ClimAID Region 1 (NYSERDA 2014).

Table 5.4.8-2. Projected Seasonal Precipitation Change in Region 1, 2050s (% change)

5 to 15 0 to 10 5 to 10 5 to 10	Winter	Spring	Summer	Fall
-5 10 +10 -5 10 +10 -5 10 +10	+5 to +15	0 to +10	-5 to +10	-5 to +10

Source: NYSERDA 2014

The projected increase in precipitation is expected to fall in heavy downpours and less in light rains. Downpours are very likely to increase in frequency and intensity, a change which has the potential to affect drinking water; heighten the risk of riverine flooding; flood key rail lines, roadways, and transportation hubs; and increase delays and hazards related to extreme weather events (NYSERDA 2011). Less frequent rainfall during the summer months may impact the ability of water supply systems. Increasing water temperatures in rivers and streams will affect aquatic health and reduce the capacity of streams to assimilate effluent wastewater treatment plants (NYSERDA 2011).

Figure 5.4.8-2 displays the project rainfall and frequency of extreme storms in New York State. The amount of rainfall in a 100-year event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA 2011). Heavy rainfall events are likely to loosen soils and could contribute to increased frequency and severity of landslides.

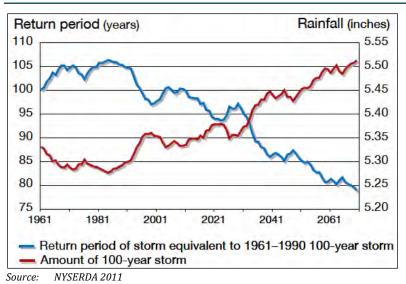


Figure 5.4.8-2. Projected Rainfall and Frequency of Extreme Storms

TŁ



Global temperature increase could affect the snowpack and its ability to hold and store water. Warming temperatures also could increase occurrence and duration of droughts, which could increase probability of wildfire and likely reduce the vegetation that helps support steep slopes. All these factors could increase the probability of landslide occurrence.

Probability of Future Occurrences

As indicated in the NYS HMP, and given the history of landslides in New York State, it is certain that future landslides will occur, but the severity of these landslides cannot be determined. Therefore, the probability of future landslides in New York State is considered high; however, since documentation on landslides in Monroe County is sparse, it is difficult to predict the extent of future landslides in the County.

The frequency of damaging landslides within Monroe County can be classified, relative to other higher risk areas, as low. However, the fact that high landslide susceptibility exists and landslides have occurred in the past suggests that the certain parts of the County's infrastructure, as well as people, are at risk from damaging landslide hazards in in the County.

In Section 5.3, the identified hazards of concern for Monroe County were ranked using various parameters. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, the probability of occurrence for landslides in Monroe County is considered 'unlikely' (not likely to occur or is unlikely to occur with less than a 1 percent annual chance probability) in Table 5.3-2.

5.4.8.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For this analysis, the hazard area is defined as the moderate susceptibility and moderate incidence landslide zones.

Impact on Life, Health, and Safety

Table 5.4.8-3 summarizes the area within each hazard ranked area, specific to Monroe County municipalities. To estimate the population located within the landslide hazard areas, the approximate hazard area boundaries were overlaid upon the 2020 Census population data (U.S. Census 2020). The Census blocks having their center (centroid) within the boundary of the landslide incidence hazard areas were used to calculate the estimated population considered exposed to this hazard. In total, 256,266 (34%) of the County's population is exposed to the moderate incidence hazard area, and 323,263 (42.9%) of the County's population is exposed to the moderate susceptibility hazard area.

		Landslide Inci	dence	Landslide Suscer	otibility
Municipality	Total Population (U.S. Census 2020)	Moderate	% of Total	Moderate	% of Total
Brighton (T)	37,137	18,626	50.2%	749	2.0%
Brockport (V)	7,104	0	0.0%	7,104	100.0%
Chili (T)	29,123	0	0.0%	29,123	100.0%
Churchville (V)	2,091	0	0.0%	2,091	100.0%
Clarkson (T)	6,904	0	0.0%	6,904	100.0%
East Rochester (V/T)	6,334	0	0.0%	0	0.0%

Table 5.4.8-3. Estimated Population Exposed to Landslides in Monroe County





		Landslide In	cidence	Landslide Susceptibility	
Municipality	Total Population (U.S. Census 2020)	Moderate	% of Total	Moderate	% of Total
Fairport (V)	5,501	0	0.0%	0	0.0%
Gates (T)	29,167	3	0.0%	29,164	100.0%
Greece (T)	96,926	907	0.9%	94,586	97.6%
Hamlin (T)	8,725	915	10.5%	7,774	89.1%
Henrietta (T)	47,096	0	0.0%	8,787	18.7%
Hilton (V)	6,027	0	0.0%	6,027	100.0%
Honeoye Falls (V)	2,706	0	0.0%	0	0.0%
Irondequoit (T)	51,043	46,987	92.1%	3,687	7.2%
Mendon (T)	6,389	0	0.0%	0	0.0%
Ogden (T)	16,585	0	0.0%	16,585	100.0%
Parma (T)	10,190	1,294	12.7%	8,733	85.7%
Penfield (T)	39,438	0	0.0%	16,149	40.9%
Perinton (T)	39,128	0	0.0%	0	0.0%
Pittsford (T)	25,714	0	0.0%	0	0.0%
Pittsford (V)	1,419	0	0.0%	0	0.0%
Riga (T)	3,495	0	0.0%	3,495	100.0%
Rochester (C)	211,328	184,647	87.4%	25,478	12.1%
Rush (T)	3,490	0	0.0%	0	0.0%
Scottsville (V)	2,009	0	0.0%	2,009	100.0%
Spencerport (V)	3,685	0	0.0%	3,685	100.0%
Sweden (T)	6,140	0	0.0%	6,134	99.9%
Webster (T)	39,676	2,885	7.3%	36,625	92.3%
Webster (V)	5,651	0	0.0%	5,651	100.0%
Wheatland (T)	2,888	0	0.0%	2,722	94.3%
Monroe County (Total)	753,109	256,266	34.0%	323,263	42.9%

Source: Godt, 2001; U.S. Census 2020

Notes: CCity Т

Town

VVillage

Impact on General Building Stock

In general, the building environment located in the high susceptibility zones and the population, structures, and infrastructure located downslope are vulnerable to this hazard. The Census blocks having their center (centroid) within the boundary of the landslide incidence hazard areas were used to calculate the estimated building stock exposed to this hazard. Table 5.4.8-4 lists the results of the general building stock exposed to this hazard.





Table 5.4.8-4. Number of Buildings located in the Landslide Hazard Area

		Landslide Inc	cidence	Landslide Susceptibility	
Municipality	Total Number of Buildings	Moderate	% of Total	Moderate	% of Total
Brighton (T)	11,693	5,997	51.3%	298	2.5%
Brockport (V)	2,224	0	0.0%	2,224	100.0%
Chili (T)	11,534	20	0.2%	11,514	99.8%
Churchville (V)	1,112	0	0.0%	1,112	100.0%
Clarkson (T)	3,411	0	0.0%	3,411	100.0%
East Rochester (V/T)	2,924	0	0.0%	0	0.0%
Fairport (V)	2,394	0	0.0%	0	0.0%
Gates (T)	11,801	10	0.1%	11,791	99.9%
Greece (T)	36,414	409	1.1%	35,395	97.2%
Hamlin (T)	5,539	573	10.3%	4,944	89.3%
Henrietta (T)	15,982	0	0.0%	2,847	17.8%
Hilton (V)	2,143	0	0.0%	2,143	100.0%
Honeoye Falls (V)	1,155	0	0.0%	0	0.0%
Irondequoit (T)	21,885	20,236	92.5%	1,505	6.9%
Mendon (T)	3,835	0	0.0%	0	0.0%
Ogden (T)	7,407	0	0.0%	7,407	100.0%
Parma (T)	5,509	715	13.0%	4,723	85.7%
Penfield (T)	15,882	0	0.0%	6,619	41.7%
Perinton (T)	16,817	0	0.0%	0	0.0%
Pittsford (T)	10,590	0	0.0%	0	0.0%
Pittsford (V)	804	0	0.0%	0	0.0%
Riga (T)	2,356	0	0.0%	2,356	100.0%
Rochester (C)	89,392	76,911	86.0%	11,952	13.4%
Rush (T)	2,808	0	0.0%	0	0.0%
Scottsville (V)	1,069	0	0.0%	1,069	100.0%
Spencerport (V)	1,654	0	0.0%	1,654	100.0%
Sweden (T)	3,465	0	0.0%	3,460	99.9%
Webster (T)	16,660	1,438	8.6%	15,132	90.8%
Webster (V)	1,633	0	0.0%	1,633	100.0%
Wheatland (T)	1,926	0	0.0%	1,751	90.9%
Monroe County (Total)	312,018	106,309	34.1%	134,940	43.2%

Source: Godt 2001; Monroe County

Notes: C City

T Town

V Village

Impact on Critical Facilities

To estimate exposure, the approximate landslide hazard areas were overlaid upon the critical facilities and lifeline facilities. Table 5.4.8-5 and Table 5.4.8-6 list the critical facilities (e.g., police, fire, emergency





operations centers [EOC], hospitals, and schools) that are located in the landslide susceptibility/incidence hazard areas. In total, 744 critical facilities and 705 lifeline facilities are located in the moderate incidence landslide area, representing 39.4 and 39.8 percent of the County totals. 737 critical facilities and 693 lifeline facilities are located in the moderate susceptibility landslide area, representing 39.0 and 39.1 percent of the County totals.

				of Critical Faci 1 the Moderate		
Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Brighton (T)	69	65	45	65.2%	42	64.6%
Brockport (V)	29	28	0	0.0%	0	0.0%
Chili (T)	111	102	3	2.7%	3	2.9%
Churchville (V)	24	23	0	0.0%	0	0.0%
Clarkson (T)	14	10	0	0.0%	0	0.0%
East Rochester (T/V)	31	29	0	0.0%	0	0.0%
Fairport (V)	17	16	0	0.0%	0	0.0%
Gates (T)	58	54	0	0.0%	0	0.0%
Greece (T)	165	158	2	1.2%	2	1.3%
Hamlin (T)	23	22	0	0.0%	0	0.0%
Henrietta (T)	111	103	0	0.0%	0	0.0%
Hilton (V)	21	20	0	0.0%	0	0.0%
Honeoye Falls (V)	17	16	0	0.0%	0	0.0%
Irondequoit (T)	103	100	97	94.2%	94	94.0%
Mendon (T)	21	20	0	0.0%	0	0.0%
Ogden (T)	42	38	0	0.0%	0	0.0%
Parma (T)	18	16	0	0.0%	0	0.0%
Penfield (T)	73	68	0	0.0%	0	0.0%
Perinton (T)	64	57	0	0.0%	0	0.0%
Pittsford (T)	45	39	0	0.0%	0	0.0%
Pittsford (V)	14	13	0	0.0%	0	0.0%
Riga (T)	20	18	0	0.0%	0	0.0%
Rochester (C)	639	605	594	93.0%	561	92.7%
Rush (T)	29	26	0	0.0%	0	0.0%
Scottsville (V)	14	13	0	0.0%	0	0.0%
Spencerport (V)	13	13	0	0.0%	0	0.0%
Sweden (T)	11	11	0	0.0%	0	0.0%
Webster (T)	55	53	3	5.5%	3	5.7%
Webster (V)	16	15	0	0.0%	0	0.0%
Wheatland (T)	23	21	0	0.0%	0	0.0%
Monroe County (Total)	1,890	1,773	744	39.4%	705	39.8%

Table 5.4.8-5. Number of Critical Facilities Located in the Moderate Incidence Landslide Hazard Area

Source: Godt 2001; Monroe County

Notes: CCity

> Т Town V

Village





Table 5.4.8-6. Number of Critical Facilities Located in the Moderate Susceptibility Landslide Hazard Area

						ine Facilities andslide Hazard
Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Brighton (T)	69	65	2	2.9%	2	3.1%
Brockport (V)	29	28	29	100.0%	28	100.0%
Chili (T)	111	102	108	97.3%	99	97.1%
Churchville (V)	24	23	24	100.0%	23	100.0%
Clarkson (T)	14	10	14	100.0%	10	100.0%
East Rochester (T/V)	31	29	0	0.0%	0	0.0%
Fairport (V)	17	16	0	0.0%	0	0.0%
Gates (T)	58	54	58	100.0%	54	100.0%
Greece (T)	165	158	158	95.8%	151	95.6%
Hamlin (T)	23	22	23	100.0%	22	100.0%
Henrietta (T)	111	103	20	18.0%	18	17.5%
Hilton (V)	21	20	21	100.0%	20	100.0%
Honeoye Falls (V)	17	16	0	0.0%	0	0.0%
Irondequoit (T)	103	100	6	5.8%	6	6.0%
Mendon (T)	21	20	0	0.0%	0	0.0%
Ogden (T)	42	38	42	100.0%	38	100.0%
Parma (T)	18	16	18	100.0%	16	100.0%
Penfield (T)	73	68	23	31.5%	23	33.8%
Perinton (T)	64	57	0	0.0%	0	0.0%
Pittsford (T)	45	39	0	0.0%	0	0.0%
Pittsford (V)	14	13	0	0.0%	0	0.0%
Riga (T)	20	18	20	100.0%	18	100.0%
Rochester (C)	639	605	42	6.6%	41	6.8%
Rush (T)	29	26	0	0.0%	0	0.0%
Scottsville (V)	14	13	14	100.0%	13	100.0%
Spencerport (V)	13	13	13	100.0%	13	100.0%
Sweden (T)	11	11	11	100.0%	11	100.0%
Webster (T)	55	53	52	94.5%	50	94.3%
Webster (V)	16	15	16	100.0%	15	100.0%
Wheatland (T)	23	21	23	100.0%	21	100.0%
Monroe County (Total)	1,890	1,773	737	39.0%	693	39.1%

Source: Godt 2001; Monroe County

Notes: С City

Т Town V

Village

Table 5.4.8-7 provides the number of lifelines in each FEMA lifeline category located in the landslide hazard areas.





FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Located in the Moderate Incidence Landslide Hazard Area	Number of Lifelines Located in the Moderate Susceptibility Landslide Hazard Area
Communications	68	20	37
Energy	14	3	10
Food, Water, Shelter	286	67	162
Hazardous Material	1	1	0
Health and Medical	93	40	37
Safety and Security	1,274	564	424
Transportation	36	10	22
Monroe County (Total)	1,772	705	692

Table 5.4.8-7. Number of Lifelines located in the Landslide Hazard Areas

Source: Godt 2001; Monroe County

Notes:

CCity Т

Town

VVillage

Impact on Economy

The impact of a landslide on the economy and estimated dollar losses are difficult to measure. As stated earlier, landslides can impose direct and indirect impacts on society. Direct costs include the actual damage sustained by buildings, property, and infrastructure. Indirect costs, such as clean-up costs, business interruption, loss of tax revenues, reduced property values, and loss of productivity are difficult to measure. Additionally, landslides threaten transportation corridors, fuel and energy conduits, and communication lines (USGS 2003). Estimated potential damage to general building stock can be quantified as discussed above. For the purposes of this analysis, damage to general building stock is discussed below.

Direct building losses are the estimated costs to repair or replace the damage caused to the building. There are zero buildings located in the high incidence and high/moderate susceptibility/incidence landslide hazard areas. A total risk exposure of approximately \$129 billion or 41.2-percent of Monroe County's total inventory is estimated for the buildings located in the landslide moderate incidence area. A total risk exposure of approximately \$115 billion or 36.7 percent of Monroe County's total inventory is estimated for the buildings located in the landslide moderate susceptibility area. Losses to Monroe County's total building inventory would impact Monroe County's tax base and the local economy.

Interstates 90, 390, 490, and 530 and the Lake Ontario State Parkway traverse the moderate incidence and moderate/susceptibility/low incidence hazard areas. Many of the County's state highways are also located within the hazard area. Refer to Figure 5.4.8-1 to see the location of major roadways in the County in relation to the hazard area.

Table 5.4.8-8. Estimated General Building Stock Replacement Cost Value in the Landslide Hazard Area

		Landslide Inc	idence	Landslide Sus	ceptibility
Municipality	Total GBS RCV	Moderate	% of Total	Moderate	% of Total
Brighton (T)	\$14,443,886,002	\$9,422,351,153	65.2%	\$632,361,466	4.4%
Brockport (V)	\$5,158,789,593	\$0	0.0%	\$5,158,789,593	100.0%





Table 5.4.8-8. Estimated General Building Stock Replacement Cost Value in the Landslide Hazard Area

		Landslide Inc	cidence	Landslide Sus	ceptibility
Municipality	Total GBS RCV	Moderate	% of Total	Moderate	% of Total
Chili (T)	\$9,206,843,885	\$154,896,989	1.7%	\$9,051,946,896	98.3%
Churchville (V)	\$938,164,078	\$0	0.0%	\$938,164,078	100.0%
Clarkson (T)	\$1,887,392,030	\$0	0.0%	\$1,887,392,030	100.0%
East Rochester (V/T)	\$3,440,171,127	\$0	0.0%	\$0	0.0%
Fairport (V)	\$2,281,456,075	\$0	0.0%	\$0	0.0%
Gates (T)	\$12,220,599,285	\$74,526,464	0.6%	\$12,146,072,821	99.4%
Greece (T)	\$26,954,378,684	\$327,172,568	1.2%	\$26,384,056,270	97.9%
Hamlin (T)	\$2,318,778,027	\$183,674,311	7.9%	\$2,125,249,787	91.7%
Henrietta (T)	\$23,460,566,322	\$0	0.0%	\$4,191,877,437	17.9%
Hilton (V)	\$2,120,287,988	\$0	0.0%	\$2,120,287,988	100.0%
Honeoye Falls (V)	\$1,813,180,690	\$0	0.0%	\$0	0.0%
Irondequoit (T)	\$13,427,006,840	\$12,715,554,454	94.7%	\$674,110,440	5.0%
Mendon (T)	\$2,852,155,915	\$0	0.0%	\$0	0.0%
Ogden (T)	\$5,558,087,440	\$0	0.0%	\$5,558,087,440	100.0%
Parma (T)	\$3,373,412,574	\$251,788,057	7.5%	\$3,095,325,391	91.8%
Penfield (T)	\$11,119,233,991	\$0	0.0%	\$4,389,584,462	39.5%
Perinton (T)	\$13,125,415,407	\$0	0.0%	\$0	0.0%
Pittsford (T)	\$10,686,774,000	\$0	0.0%	\$0	0.0%
Pittsford (V)	\$1,776,834,511	\$0	0.0%	\$0	0.0%
Riga (T)	\$1,539,492,845	\$0	0.0%	\$1,539,492,845	100.0%
Rochester (C)	\$119,943,371,056	\$106,058,619,286	88.4%	\$13,258,329,376	11.1%
Rush (T)	\$1,816,445,354	\$0	0.0%	\$0	0.0%
Scottsville (V)	\$908,716,753	\$0	0.0%	\$908,716,753	100.0%
Spencerport (V)	\$1,580,844,696	\$0	0.0%	\$1,580,844,696	100.0%
Sweden (T)	\$3,402,258,236	\$0	0.0%	\$3,344,197,382	98.3%
Webster (T)	\$11,510,191,170	\$735,955,114	6.4%	\$10,730,075,460	93.2%
Webster (V)	\$3,634,066,282	\$0	0.0%	\$3,634,066,282	100.0%
Wheatland (T)	\$2,509,077,040	\$0	0.0%	\$2,247,363,308	89.6%
Monroe County (Total)	\$315,007,877,896	\$129,924,538,398	41.2%	\$115,596,392,202	36.7%

Source: Godt 2001; Monroe County

Notes: GBS General Building Stock;

RCV Replacement Cost Value.

C City

T Town

V Village





Impact on the Environment

A landslide event alters the landscape. In addition to changes in topography, vegetation and wildlife habitats may be damaged or destroyed. Soil and sediment runoff will accumulate downslope, potentially blocking waterways and roadways and impacting quality of streams and other water bodies. Additional environmental impacts include loss of forest productivity.

Furthermore, soil and sediment runoff can accumulate downslope potentially blocking waterways and roadways and impacting quality of streams and other water bodies. Mudflows that erode into downstream waterways can threaten the life of freshwater species (USGS 2020). The impacts of eroded landscape can travel for miles downstream into adjacent waterways and create issues for surrounding watersheds.

Cascading Impacts On Other Hazards

Landslide events can have cascading impacts on utility failure in Monroe County. As discussed in earlier sections, landslides may disrupt the functionality of utilities if the debris falls, topples, or spreads over the utilities providing services to the County. For example, electric utilities may become disconnected if power lines are broken from displaced geologic material. Water utilities may become breached with excess debris and/or contaminants carried by landslide events.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

As discussed in Section 4 (County Profile), areas targeted for future growth and development have been identified across the County. Any areas of growth located in areas with moderate landslide incidence or susceptibility could be potentially impacted by the landslide hazard. Please refer to the specific areas of development indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of the population can impact the number of persons exposed to landslide. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

Climate is defined not simply as average temperature and precipitation, but also by the type, frequency, and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of extremes such as severe storms, including those that may bring intense and prolonged precipitation (EPA 2013). An increase in rainfall intensity and duration will saturate the soil and potentially





erode the local landscape and impact slope stability. This may lead to an increase of landslide events in Monroe County.

While predicting changes in events under a varying climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society, and the environment (EPA 2013). The potential effects of climate change on Monroe County's vulnerability to landslide events shall need to be considered as a greater understanding of regional climate change impacts develop.

Change of Vulnerability Since 2017 HMP

For this HMP Update, the risk for the County's population, building stock, and critical facilities was assessed, and, overall, the County's landslide vulnerability has remained unchanged.





5.4.9 Severe Storm

This section provides a profile and vulnerability assessment of the severe storm hazard for Monroe County.

5.4.9.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the severe storm hazard.

Hazard Description

Severe storm events are a common occurrence in Monroe County. A variety of severe storm types, such as thunderstorms, lightning, hail, tornadoes, high winds, and tropical cyclones have damaged property and infrastructure, disrupt power, downing trees and power lines, and causing injuries and fatalities. The following section describes the different severe storm types that impact Monroe County.

Thunderstorms

Thunderstorms can lead to flooding, landslides, strong winds, and lightning. Roads could become impassable from flooding, downed trees or power lines, or a landslide. Downed utility poles can lead to utility losses, such as electricity, phone, and water (from loss of pumping and filtering capabilities). A thunderstorm is a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder (NWS, National Weather Service Glossary 2021). A thunderstorm forms from a combination of moisture, rapidly rising warm air, and a force capable of lifting air, such as a warm and cold front, a sea breeze, or a mountain. Thunderstorms form from the equator to as far north as Alaska. Although thunderstorms generally affect a small area when they occur, they have the potential to become dangerous due to their ability in generating tornadoes, hailstorms, strong

winds, flash flooding, and lightning. The NWS considers a thunderstorm *severe* only if it produces damaging wind gusts of 58 mph or higher or large hail one inch (quarter size) in diameter or larger or tornadoes (NWS, National Weather Service Glossary 2021).

Lightning

Lighting is a bright flash of electrical energy produced by a thunderstorm. The resulting clap of thunder is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel. All thunderstorms produce lightning and are very dangerous. Lightning ranks as one of the top weather killers in the United States, killing approximately 50 people and injuring hundreds each year. Lightning can occur anywhere there is a thunderstorm. Lightning can be cloud to air, cloud to cloud, and cloud to ground.

Lightning can damage homes and injure people. In the United States, an average of 300 people are injured and 80 people are killed by lightning each year. Typical thunderstorms are 15 miles in diameter and last an average of 30 minutes. An estimated 100,000 thunderstorms occur each year in the United States, with approximately 10 percent of them classified as severe. During the warm season, thunderstorms are responsible for most of the rainfall.

Hailstorms

Hail forms inside a thunderstorm where there are strong updrafts of warm air and downdrafts of cold water. If a water droplet is picked up by the updrafts, it can be carried well above the freezing level. Water droplets freeze when temperatures reach 32 °F or colder. As the frozen droplet begins to fall, it might thaw as it moves into warmer air toward the bottom of the thunderstorm, or the droplet might be picked up again by another updraft and carried back into the cold air to re-freeze. With each trip above and below the freezing level, the frozen





droplet adds another layer of ice. The frozen droplet, with many layers of ice, falls to the ground as hail (NSSL 2021).

High Winds

Wind begins with differences in air pressures. It is rough horizontal movement of air caused by uneven heating of the earth's surface. Wind occurs at all scales, from local breezes lasting a few minutes to global winds resulting from solar heating of the earth. High winds are often associated by other severe weather events such as thunderstorms, tornadoes, hurricanes, and tropical storms (NWS, Air Pressure and Wind 2012).

Tornadoes

A tornado is a violently rotating column of air that extends from a thunderstorm to the ground with an average forward speed of 30 miles per hour (mph). Tornadoes typically develop from either a severe thunderstorm or hurricane as cool air rapidly overrides a layer of warm air. Tornadoes can occur at any time of the year, with peak seasons at different times for different states (NWS, Thunderstorms, Tornadoes, Lightning...Nature's Most Violent Storms 2010).

Tropical Cyclones

Tropical cyclones (hurricanes) are fueled by a different heat mechanism than other cyclonic windstorms such as nor'easters and polar lows. The characteristic that separates a tropical storm from another cyclonic system is that at any height in the atmosphere, the center of a tropical storm will be warmer than its surroundings, a phenomenon called "warm core" storm systems (NOAA 2011)Tropical cyclones strengthen when water evaporated from the ocean is released as the saturated air rises, resulting in condensation of water vapor contained in the moist air. Tropical cyclones begin as disturbed areas of weather, often referred to as tropical waves. As the storm organizes, it is designated as a tropical depression.

A tropical storm system is characterized by a low-pressure center and numerous thunderstorms that produce strong winds of 39 to 73 mph and heavy rain. A hurricane is a tropical storm that attains hurricane status when its wind speed reaches 74 mph or higher. Tropical systems may develop in the Atlantic between the Lesser Antilles and the African coast or may develop in the warm tropical waters of the Caribbean and Gulf of Mexico. These storms may move up the Atlantic coast of the United States and impact the eastern seaboard or move into the United States through the states along the Gulf Coast, bringing wind and rain as far north as New England before moving offshore and heading east.

Location

All of Monroe County is exposed to thunderstorms, lightning, hailstorms, high winds, tornadoes, and tropical cyclones. Monroe County is located in Western New York State; its entire northern border is Lake Ontario. Despite Monroe County's inland location, coastal storms, such as hurricanes and tropical storms, can impact the County. Hurricanes and tropical storms can impact Monroe County from June to November, the official eastern U.S. hurricane season; however, late July to early October is the most likely period for hurricanes and tropical storms to impact the County when North Atlantic Ocean waters are warmest (NYS DHSES 2019)Although one of the most severe impacts associated with hurricanes is storm surge, due to Monroe County's location, storm surge is not a concern for the County and has not been detailed in this profile.

According to the FEMA Winds Zones of the United States map, Monroe County is located within Wind Zone III where wind speeds can reach up to 200 mph. Figure 5.4.9-1 illustrates wind zones across the United States, which indicate the impacts of the strength and frequency of wind activity per region. The information on the figure is based on 40 years of tornado data and 100 years of hurricane data collected by FEMA.





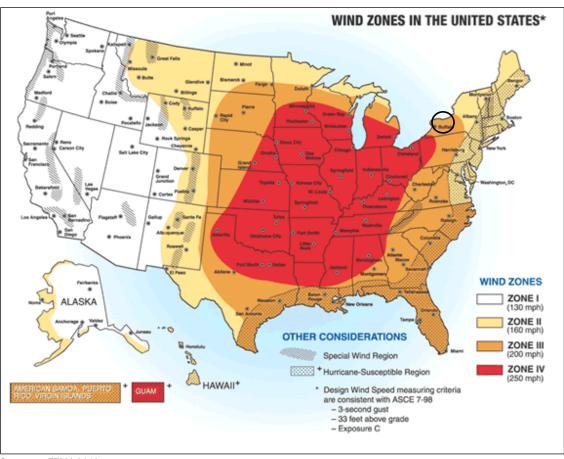


Figure 5.4.9-1. Wind Zones in the United States

 Source:
 FEMA 2012

 Note:
 The black oval indicates the approximate location of Monroe County.

Extent

The extent (severity or magnitude) of a severe storm is largely dependent upon the most damaging aspects of each type of severe weather. This section describes the extent of thunderstorms, lighting, hail, windstorms, tornadoes, and tropical cyclones in Monroe County.

Thunderstorms

Severe thunderstorm watches and warnings are issued by the local NWS office and the Storm Prediction Center (SPC). The NWS and SPC will update the watches and warnings and notify the public when they are no longer in effect. NWS issues statements, watches, and warnings for thunderstorms:

- Special Weather Statement: Issued for strong storms that are below severe levels but may have impacts. Usually reserved for the threat of wind gust of 40-58 mph or small hail <1 inch.
- Severe Thunderstorm Watch: Severe thunderstorms with large hail, damaging winds, and/or tornadoes are possible, but the exact time and location of storm development is still uncertain. A watch means be prepared for storms.
- Severe Thunderstorm Warning: A severe thunderstorm is imminent or occurring; it is either detected by weather radar or reported by storm spotters. A severe thunderstorm is one that produces winds 58 mph or stronger and/or hail 1 inch in diameter or larger. A warning means to take shelter (NWS 2020)





Figure 5.4.9-2 presents the severe thunderstorm risk categories, as provided by the SPC.



THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with all thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intens
1	The second secon	A A	1		
Winds to 40 mph Small hail	• Winds 40-60 mph • Hall up to 1" • Low tornado risk	 One or two tornadoes Reports of strong winds/wind damage Hail ~1", isolated 2" 	A few tornadoes Several reports of wind damage Damaging hail, 1 - 2"	Strong tomadoes Widespread wind damage Destructive hail, 2 ^v +	 Tornado outbreak Derecho

Lightning

Lightning is associated with moderate to severe thunderstorms. Lightning severity is determined by the frequency of lightning strikes during a storm. The New York City Office of Emergency Management notes that lightning strikes occur with moderate frequency in the State of New York, with 3.8 strikes occurring per square mile each year. Multiple devices are available to track and monitor the

frequency of lightning (NYC Emergency Management 2020).

Hailstorms

The severity of hail is measured by duration, hail size, and geographic extent. Hail can exhibit a variety of sizes, though only the very largest hail stones pose serious risk to people, if exposed (DHSES 2019). The size of hail is estimated by comparing it to a known object. The Tornado and Storm Research Organization (TORRO) Hailstorm Intensity Scale (H0 to H10) relates typical damage and hail sizes. Refer to Appendix H (Supplementary Data) for a table that outlines the TORRO scale.

High Winds

The following table provides the descriptions of winds and their associated sustained wind speed used by the NWS during wind-producing events. The Beaufort wind scale, developed in 1805, is also used today to classify wind conditions, and is provided in Appendix H (Supplementary Data).







Table 5.4.9-1. NWS Wind Descriptions

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very Windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
None	5-15 or 10-20
Light or light and variable wind	0-5

Source: NWS 2010 mph miles per hour

The NWS issues advisories and warnings for winds that are typically site-specific. The NWS issues high wind advisories, watches, and warnings when wind speeds can pose a hazard or are life threatening. The criterion for each of these varies from state to state. According to the NWS (2020), wind warnings and advisories for New York State are as follows:

- *High Wind Warnings* are issued when sustained wind speeds of 40 mph or greater lasting for one hour or longer or for winds of 58 mph or greater for any duration or widespread damage are possible.
- *Wind Advisories* are issues when sustained winds of 30 to 39 mph are forecast for one hour or longer, or wind gusts of 46 to 57 mph for any duration.

Tornadoes

The magnitude or severity of a tornado is categorized using the Enhanced Fujita Tornado Intensity Scale (EF Scale). This is the scale now used exclusively for determining tornado ratings by comparing wind speed and actual damage. Figure 5.4.9-4 illustrates the relationship between EF ratings, wind speed, and expected tornado damage.

Tornado watches and warning are issued by the local NWS office. A tornado watch is released when tornadoes are possible in an area. A tornado warning means a tornado has been sighted or indicated by weather radar. The current average lead time for tornado warnings is 13 minutes. Occasionally, tornadoes develop so rapidly, that little, if any, advance warning is possible (NOAA SPC 2018).





Figure 5.4.9-4 Explanation of EF-Scale Ratings

EF Rating	Wind Speeds	Expected Damage
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.

Source: NOAA 2020

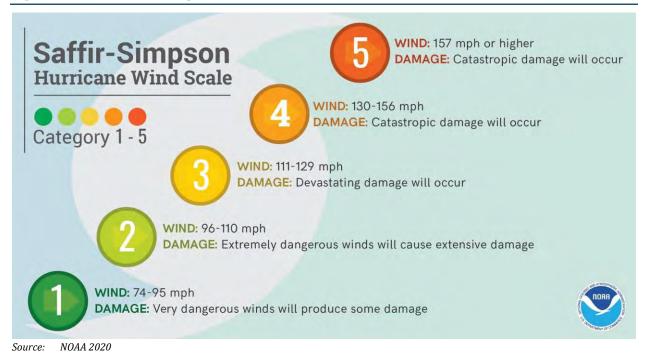
Tropical Cyclones

The extent of a hurricane or tropical storm is commonly categorized in accordance with the Saffir-Simpson Hurricane Wind Scale, which assigns a designation of tropical storm for storms with sustained wind speeds below 74 mph and a hurricane category rating of 1–5 based on a hurricane's increasing sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered *major hurricanes* because of their potential for significant loss of life and damage. Tropical Storms and Category 1 and 2 storms are still dangerous and require preventative measures (NOAA 2020). Figure 5.4.9-5 presents this scale, which is used to estimate the potential property damage and flooding expected when a hurricane makes landfall. Most tropical cyclones that impact Monroe County are remnants of former tropical storms or hurricanes.





Figure 5.4.9-5 The Saffir-Simpson Scale



Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with severe storms throughout New York State and Monroe County; therefore, the loss and impact information for many events varies depending on the source. The accuracy of monetary figures discussed is based on the available information in cited sources.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State was included in 45 FEMA declared severe storm or hurricane specific disasters (DR) or emergency declarations (EM). Monroe County was included in 5 of these 45-related declarations (Table 5.4.9-2). In addition, Monroe County was included in a special hurricane related emergency declaration for support for the Hurricane Katrina evacuation in 2005.

FEMA Declaration Number	Date(s) Of Event	Event Type	Details
DR-1244	September 7, 1998	Severe Weather	New York - Severe Weather
DR-1233	June 25, 1998 - July 10, 1998	Severe Weather	New York Severe Storms and Flooding
DR-1534	May 13, 2004 - June 17, 2004	Severe Weather	New York Severe Storms and Flooding
DR-1564	August 13, 2004 - September 16, 2004	Severe Weather	New York Severe Storms and Flooding
EM-3351	Oct 27, 2012 - Nov 8, 2012	Hurricane	New York Hurricane Sandy

Table 5.4.9-2. FEMA DR and EM Declarations for Severe Storm Events in Monroe County, 1954 to 2020

Source: FEMA 2022





USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that included or may have included losses due to severe storms:

- S3885 2015 Excessive Rain, High Winds, Hail, Lightning, and Tornado
- S4595 2019 Hail (USDA 2022)

The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are low the following years as well. USDA records indicate that Monroe County has experienced crop losses from severe storm events in the years when USDA disasters were declared. Table 5.4.9-3 provides details regarding crop losses in Monroe County according to USDA records.

Year	Сгор Туре	Cause of Loss	Losses
2015	Apples	Hail	\$57,906
2015	Apples	Wind/Excess Wind	\$29,122
2015	All Other Crops	Hail	\$3,870
2019	Corn	Wind/Excess Wind	\$5,112
2019	Apples	Hail	\$23,503

Table 5.4.9-3. USDA Crop Losses from Severe Storms in Monroe County (2015-2022)

Source: USDA 2022

Previous Events

Table 5.4.9-4 identifies the known severe storm events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.9-4.Severe Storm Events in Monroe County, 2015 to 2022

Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
January 4, 2015	High Wind	N/A	N/A	Monroe County	Deepening low pressure tracked from western Lake Erie across far southern Ontario to Quebec dragging a cold front across the region. Strong winds increased to near 60 mph about two to three hours after the cold front passage. The strong winds downed trees and wires across western New York. Scattered power outages resulted. Some specific damage locations included St. Paul Boulevard in Irondequoit. The County experienced an estimated \$20,000 in property damage.
April 10, 2015	High Wind	N/A	N/A	Monroe County	In the wake of a cold front, strong, damaging winds developed across parts of the area mainly downwind of Lakes Erie and Ontario. Wind gusts were measured to 62 mph at the Buffalo Airport, 60 mph at the Rochester Coast Guard and 58 mph at the Niagara Falls and Rochester Airports. The winds downed trees and powers lines across the eight county area. Tens of thousands were without power. The County experienced an estimated \$20,000 in property damage.
May 27, 2015	Thunderstorm Wind	N/A	N/A	Riga, Severance	A line of thunderstorms crossed the Niagara Frontier and western Finger Lakes during the evening hours. Two storms merged over Monroe County and produced isolated damage. Trees and power lines were reported downed by thunderstorm winds near Churchville and Chili. Law enforcement reported trees and wires down by thunderstorm winds in the Town of Riga and Severance. Property damage was an estimated \$25,000.
June 10, 2015	Thunderstorm Wind, Hail	N/A	N/A	Ogden, Gates, Chili, Maplewood, Henrietta, Pittsford, Blackwatch Hills, Bushnell Basin	Thunderstorms developed along outflow boundary in a warm, humid airmass during the late evening hours. The thunderstorms produced damaging winds and large hail. Although wind gusts were measured to 58 mph at the Rochester airport, after a NWS survey of the damage it was estimated that wind gusts were probably 65 to 70 mph. The storms produced a swath of damage extending across southern Monroe. The storms downed trees and power lines throughout a three-county region with several reports of significant structural and property damage. Hail, up to one inch in diameter, was reported in Fairport. The NWS surveyed damage in Ogden Center, Gate, Chili, Henrietta, Pittsford, Fairport and Bushnell Basin. Law enforcement reported numerous trees and wires down from thunderstorm winds near Ogden Center in the Town of Ogden. Social media contained reports of numerous trees and wires down from thunderstorm winds near Gates. Law enforcement reported numerous trees and wires down from thunderstorm winds near Gates. Law enforcement reported numerous trees and moles at the Double Tree Hotel near Henrietta. Several cars were damaged by downed trees in Henrietta. Law enforcement reported numerous trees and wires down from thunderstorm winds near Pittsford. A power transformer was damage near South Main Street and Mile Post Lane. Social media showed numerous reports of downed trees and wires in Bushnell Basin. The
June 12, 2015	Thunderstorm Wind	N/A	N/A	North Rush	County experienced an estimated \$130,000 in property damage. Two lines of showers and thunderstorms moved across the region during the afternoon and early evening hours. The strong thunderstorms produced damaging winds that downed trees and powers lines across the western southern tier and Finger Lakes region.





Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts	
					Law Enforcement reported trees and wires downed by thunderstorm winds on East River Road. The County experienced an estimated \$10,000 in property damage.	
June 23, 2015	Thunderstorm Wind	N/A	N/A	Honeoye Falls, Rush, MendonAn area of showers and thunderstorms moved across the lower Great Lakes region during the overnight and very early morning hours. The first round of showers moved across southern Ontario and cross the Buffalo area before moving across the Genesee Valley and western Fing Lakes. The second round moved across Lake Erie into the western southern tier. The thunderstorms produced strong winds that downed trees and power lines. Several of the down trees damage structures and cars. Some roads were temporarily blocked by debris.News reports of trees and wires downed by thunderstorm winds at Honeoye Falls Airport were		
					received. Law enforcement reported trees and wires downed by thunderstorm winds in Rush and Mendon. The County experienced an estimated \$30,000 in property damage.	
July 7, 2015	Thunderstorm Wind	N/A	N/A	Spencerport	Thunderstorms accompanied the passage of a cold front across the region. Thunderstorm winds produced wind gusts that downed trees and power lines. Damage from downed trees was reported in Spencerport. Winds were estimated near 60 mph. Total property damage was an estimated \$15,000.	
January 10, 2016	High Wind	N/A	N/A	Monroe County	On Sunday, January 10th, deep low pressure crossed Ohio during the morning, southern Ontario through the day, reaching Quebec Sunday evening. The system dragged a cold front across the region during the late afternoon hours. Ahead of the cold front, southeast wind resulted in downslope wind off the Chautauqua Ridge. Across the entire south shore of Lake Ontario, winds increased following the front. The strong winds brought down trees and power lines. Utilities reported thousands without power scattered throughout the region. Some of the falling trees damaged homes and automobiles. Specific wind gusts downwind of Lake Ontario included 58 mph at Rochester Airport. The County experienced an estimated \$15,000 in property damage.	
May 29, 2016	Thunderstorm Wind	N/A	N/A	Mumford	With warm, humid air in place, the passage of an upper air disturbance initiated scattered showers and thunderstorms across the region. Some of these storms reached produced damaging wind gusts that downed trees and power lines. Law enforcement reported a large tree downed by thunderstorm winds at the intersection of Oatka Creek Road and Route 36. Total property damage was an estimated \$15,000.	
June 20, 2016	Hail	N/A	N/A	Brighton	Thunderstorms developed ahead of an approaching cold front. Several of the storms produced three quarter inch hail near Brighton.	
July 1, 2016	Thunderstorm Wind	N/A	N/A	Rochester, Penfield	Thunderstorms developed as a cold front interacted with the lake breezes off Lakes Erie and Ontario. Nickel-sized hail fell in Bemus Point, Chautauqua County, and near Shelby, Orleans County. Thunderstorms the moved into Monroe County briefly pulsed up and produced damage in Rochester and Penfield before rapidly weakening. In Rochester, a tree fell onto a house on Meredith Street. In Penfield, several large tree limbs were downed. One falling tree caused minor structural damage to the corner of a house. Total property damage was an estimated \$35,000.	





Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts	
August 13, 2016	Thunderstorm Wind	N/A	N/A	Greece, Brighton	Numerous thunderstorms developed on outflow and lake breeze boundaries. The thunderstorms downed trees and wires throughout the region. Law enforcement reported wires downed by	
15, 2010				Dirgittoli	thunderstorm winds in Greece and Brighton. Total property damage was an estimated \$10,000.	
January 11, 2017	High Wind	N/A	N/A	Monroe County	Gusty winds accompanied the passage of a deepening storm system crossing the upper Great	
March 1- 2, 2017	High Wind	N/A	N/A	Monroe County	Strong winds followed the passage of a cold front across the area. The winds increased during the evening hours of March first before subsiding by daybreak on the second. Gusts as high as 64 mph were measured. The strong winds downed trees and power lines throughout the region. Falling trees damaged homes or automobiles in: Rochester (on North Clinton Avenue), Webster, and Irondequoit. Measured wind gusts included 64 mph at Rochester Airport. \$40,000 in property damages were reported.	
March 8, 2017	High Wind	N/A	N/A	Monroe County	Unusually deep low pressure moved from northwest Ontario across Hudson Bay. The low brought strong winds to the entire region with sustained winds up to 49 mph and wind gusts as high as 81 mph. A significant amount of damage resulted with hundreds of thousands left without power, over 100,000 in Monroe County alone. Trees and power lines were downed. Power poles were snapped. In Chili, a large section of fence was impaled into the second story of a house. Numerous flights into the Buffalo and Rochester Airports had to be diverted due to the winds. This in turn resulted in cancellation of some outbound flights from those airports. Measured wind gusts included: 81 mph at Rochester Airport (Monroe County), 67 mph at Brockport (Monroe County), and 47 mph at Gates (Monroe County). Falling trees damaged homes or automobiles in Irondequoit, Braddock Bay, Webster and Brighton (Monroe County). \$1.5 million in property damages were reported.	
April 4, 2017	High Wind	N/A	N/A	Monroe County	Strong winds followed the passage of a cold front across the area. The winds increased during the afternoon hours and evening hours of April 4th. Wind gusts as high as 59 mph were measured. The strong winds downed trees and power lines throughout the region. A portion of Route 19 in Warsaw was closed by downed trees and wires. \$30,000 in property damage was reported.	
May 1, 2017	Thunderstorm Wind	N/A	N/A	Gates	Thunderstorm winds downed trees on Pasadena Drive and knocked a tree onto a house on Tarwood Drive in Gates. Total property damage was an estimated \$35,000.	
May 14, 2017	Hail	N/A	N/A	Rochester	A thunderstorm moving across the Finger Lakes dropped pea- to dime-sized hail on Rochester and the southeast suburbs, including the annual Lilac Festival.	
June 15, 2017	Thunderstorm Wind	N/A	N/A	Mendon	Under the influence of a warm, moist airmass, thunderstorms developed across western and north-central New York. Law enforcement reported trees and wires downed by thunderstorm winds in Mendon. Total property damage was an estimated \$14,000.	
June 18, 2017	Thunderstorm Wind	N/A	N/A	Scottsville, Brighton	Broadcast media reported trees and wires downed by thunderstorm winds on Quaker Road in Scottsville. Total property damage was an estimated \$10,000. Social media had reported of trees and wires downed by thunderstorm winds in Brighton. Total property damage was estimated at \$12,000.	





Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
July 8, 2017	Lightning	N/A	N/A	Monroe County	A cold front slowly advanced its way across the eastern Great Lakes region during the overnight and early morning hours. The thunderstorms produced damaging winds and large hail. The thunderstorm winds downed trees and power lines. Route 183 near Williamstown and Route 11 in Hastings were blocked by debris. Two homes in Monroe County, one in Brockport on Monroe-Orleans County Line Road and one in Penfield on Pipers Meadow Trail, were struck by lightning during the pre-dawn hours. All occupants were able to get out without injury. Total property damage was an estimated \$45,000.
July 24, 2017	Lightning	N/A	N/A	Rochester Airport	Thunderstorms developed during the early morning hours along a warm front extending across the Genesee Valley and Finger Lakes. A lightning strike hit the Air Traffic Control Tower. No one was injured or evacuated and flights were not affected however smoke was reported in the air traffic control room. \$5,000 in property damage was reported.
August 1, 2017	Hail	N/A	N/A	Spencerport	Thunderstorms developed in afternoon summertime warmth and humidity. One of the storms that developed along the boundary of the Lakes Erie and Ontario lake breezes produced large hail. Hail up to one inch in diameter was reported in near Spencerport.
August 22, 2017	Thunderstorm Wind	N/A	N/A	Point Pleasant, Henrietta	Three waves of severe storms moved across western and north-central NY making for an almost 8-hour severe event. Law enforcement reported wires downed by thunderstorm winds on Laser Street, as well as trees downed by thunderstorm winds that were blocking Brighton-Henrietta Town Line Road. Total property damage was an estimated \$65,000.
October 15, 2017	Thunderstorm Wind	N/A	N/A	Crittenden, Maplewood, Beechwood, Barnard, Webster, Railroad Mills, Bushnell Basin, Fairport, Blackwatch Hills	Thunderstorms ahead of and along an approaching strong cold front produced damaging winds during the afternoon and early evening hours. The thunderstorm winds downed trees and power lines throughout the region. Wind gusts were measured to 63 mph at Rochester Airport. Law enforcement reported trees and wires downed by thunderstorm winds near Genesee and Vixette Streets. Law enforcement reported wires downed by thunderstorm winds on Wilcox Street and Crombie Street in Beechwood. Law enforcement reported trees and wires downed by thunderstorm winds on West Avenue in Barnard. Law enforcement reported trees and wires downed by thunderstorm winds on Meadow Drive in Webster. Law enforcement reported trees and wires downed by thunderstorm winds on Thornell Road at Railroad Mills. Law enforcement reported trees and wires downed by thunderstorm winds near Mitchell Road and Route 31 at Bushnell Basin. Law enforcement reported trees and wires downed by thunderstorm winds on Crystal Spring Lane in Fairport. Photos of a tree blown down onto a house and car were posted on social media in Blackwatch Hills. Total property damage was an estimated \$100,000.
October 30, 2017	High Wind	N/A	N/A	Monroe County	Low pressure across the mid-Atlantic rapidly intensified as it tracked across central New York. The winds were especially strong along the Lake Ontario shoreline counties. The winds downed trees and power lines. Some structural damage was reported. There were reports road closures due to downed limbs and wires. Several tens of thousands were without power due to scattered outages. Total property damage in the County was estimated at \$35,000.
April 4, 2018	High Wind	N/A	N/A	Barnard	A surface low deepened resulted in damaging wind gusts occurred across the entire area with multiple trees down, wires down, and overturned semis. Multiple trees and wires were reported down throughout the County through the event. A tree fell onto a house in Barnard. Total property damage in the County was estimated at \$40,000.





Dates of	Errort True o	FEMA Declaration	Monroe County Designated?	Location	Lesses / June etc
Event July 16, 2018	Event Type Thunderstorm Wind, Hail	Number N/A	N/A	Location Rochester, Penfield, Webster	Losses / Impacts A very warm and humid air mass was in place across western and north central New York. As is usually the case with an approaching cold front, thunderstorms fired up along a pre-frontal boundary that extended from the Lake Erie shoreline northeast to Rochester. Trees and wires were down on Garland Avenue, Maple Street, and Campbell Street and a tree fell on a house in Rochester. 0.75 inch hail was reported in Penfield. Trees and wires were down in Webster. Total property damage was an estimated \$15,000.
August 6, 2018	Thunderstorm Wind	N/A	N/A	Egypt	Storms developed south of Lake Ontario. A tree fell on a vehicle on Mason Road. Total property damage was an estimated \$10,000.
November 6, 2018	High Wind	N/A	N/A	Spencerport, Brighton, Chili	Strong winds developed behind a cold front. Trees, utility poles, and wires were down in Spencerport, Brighton, and Chili.
January 1, 2019	High Wind	N/A	N/A	Monroe County	The new year was rung in by damaging wind gusts. The early morning saw gusts reported up to 61 mph. Trees and wires were reported down, especially in the western and northern portions of the County. Total property damage was an estimated \$25,000.
February 8, 2019	High Wind	N/A	N/A	Monroe County	Strong and deepening low pressure moved across the Upper Great Lakes with a trailing cold front crossing the region. The track of the low was quite far north, and it tracked more NNE instead of ENE. The wind field aloft decreased quickly after the cold frontal passage, leaving only a very narrow 1-2 hour window just behind the cold front where warning criteria gusts occurred to the northeast of the lakes. Wet ground conditions increased the impact as the roots of trees were weaker because of this. Maximum wind gusts reported during the event included 59 mph at the Rochester Airport. Trees were reported down in many parts of Monroe County. \$15,000 in property damage was estimated.
February 24-25, 2019	High Wind	N/A	N/A	Monroe County	 Low pressure over the central Plains rapidly deepened as it moved into the central Great Lakes, ending up as a 970 mb low over western Quebec. A strong cold front trailing the low sliced through western New York trailing it and ushering in very gusty winds. Selected peak wind gusts included 66 mph at Rochester. Damage was reported from the wind. \$50,000 in property damage was estimated. Many reports were received of trees and wires down throughout the County causing substantial structural damage to homes and businesses. Thousands were reported without power.
March 10, 2019	High Wind	N/A	N/A	Monroe County	A post cold frontal southwest wind event to the northeast of Lake Erie and Lake Ontario. Trees and powerlines were reported down, resulting in \$5,000 in property damage.
May 19, 2019	Hail	N/A	N/A	Webster, Union Hill	Pea to dime sized hail was reported from a thunderstorm in Webster. 0.88 inch hail lasted about three minutes in Union Hill.
August 8, 2019	Hail, Thunderstorm Wind	N/A	N/A	Henrietta, Penfield, Pittsford, East Rochester	Ahead of a strong cold front, storms along a prefrontal trough became severe. 0.75 inch hail was reported in Henrietta and Penfield. A tree was down and blocking Kennedy Road in Penfield. A tree was reported down onto power lines near Jefferson and Eastview Terrance in Pittsford resulting in \$1,000 in property damage. A tree was reported down onto power lines on the 900 block of South Washington in East Rochester resulting in \$1,000 in property damage.
October 31-	High Wind	DR-4472	No	Monroe County	A deepening area of consolidated low pressure tracked from the north shoreline of Lake Erie to Toronto, and then along the northern shoreline of Lake Ontario Thursday evening, October 31st.





Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
November 1, 2019					Immediately behind the front, winds were southwest and channeled across the typical locations northeast of Lake Erie from Dunkirk to the Niagara Frontier and eastward to Rochester. Southwest wind gusts were 45 to 50 mph. Enough damage was done across New York to have a Presidential Disaster Declaration. Heavy rain also brought flooding concerns. All three climate stations broke their daily October 31 records with 1 to 3 inches of rain falling across the CWA. \$600,000 in property damage was reported.
January 12, 2020	High Wind	N/A	N/A	Monroe County	Post-frontal winds mixed well behind an early morning cold front. Widespread non- thunderstorm wind damage was reported in all lakeshore counties from Monroe westward along Lake Ontario. \$20,000 in property damage was reported.
April 13, 2020	High Wind	N/A	N/A	Monroe County	Low pressure strengthened rapidly as it tracked from the mid-Mississippi River Valley resulting in high winds. Trees were reported down in multiple portions of the County resulting in \$10,000 in property damage.
July 29, 2020	Thunderstorm Wind, Tornado	N/A	N/A	Beechwood, Irondequoit, Scottsville	A leading surface boundary sagged from lower Michigan across the Southern Tier and Genesee Valley. Ample moisture pooling evidenced by precipitable water values in excess of 1.5 inches and modest shear generated instability that allowed for thunderstorms to vertically develop into a layer of dry air aloft. This provided the first set of wind damage producing thunderstorms. These storms developed notable rotation, resulting in one tornado in Monroe County. A tree was down onto a parked car on Baycliff Drive in Beechwood. A large tree fell onto a home on Druid Hill Park in Irondequoit. Two trees were down on Quaker Road in Scottsville. Total property damage was an estimated \$17,000. A supercell thunderstorm developed over Genesee County and tracked east-southeast from just south of the interchange of the New York State Thruway and I-490. Scattered tree limb damage consistent with straight line winds was found along the Oatka Creek upon following the path of this storm into Monroe County starting just east of Beulah Road and continuing through Mumford. Damage became more concentrated upon crossing Wheatland Center Road and entering Oatka Creek Park. A grassy field was laid down flat in the opposite direction of the storm motion with tree damage to the south end of the field indicating rotation with several damaged trees having broken to the northeast. Farther east, a partially- flattened corn field with two shallow-rooted uprooted trees along its southern periphery was coupled with several broken trees along a hiking path through Oatka Creek Park indicating opposing directional damage. Scattered damage continued farther east from Oatka Creek Park along Quaker Road south of Scottsville. A second more concentrated area of damage was found near the intersection of Quaker Road and Route 251. Several trees were downed along the hillside west of Route 251, into Route 251, and on the property at the southeast corner of Route 251 and Quaker Road. This included at least three uprooted shallow-rooted trees and one approxima
					Due to the fact that the majority of the path of this storm was along Oatka Creek and through the Oatka Creek Park and in an area that is primarily rural, there was no damage to any





		FEMA	Monroe			
Dates of Event	Event Type	Declaration Number	County Designated?	Location	Losses / Impacts	
Lvent	Lvent Type	Number	Designateur	Location	structures. Because of this, the National Weather Service use exclusively tree damage indicators to reach a conclusion of an EF0 strength and maximum wind speed of 75 mph. \$10,000 in property damage was reported.	
November 15-16, 2020	High Wind	N/A	N/A	Monroe County	A rapidly intensifying low pressure system pushed a cold front across the area during the latter half of November 15. Along the cold front, shallow convection developed with widespread non- severe hail and widespread wind gusts over 60 mph. In the wake of the front, a second and longer-lasting period of non-convective high winds persisted through much of the evening and into the overnight east of Lake Ontario. Widespread damage was reported from both the thunderstorm winds and non-thunderstorm winds. \$150,000 in property damages were reported.	
March 26, 2021	High Wind	N/A	N/A	Monroe County	A compact closed low passed just to the northwest of the area. Non-thunderstorm measured wind gusts included 59 mph at the Rochester Airport. \$10,000 in property damage was reported.	
June 21, 2021	Thunderstorm Wind	N/A	N/A	Rush, Henrietta, Bushnell Basin, Railroad Mills, Irondequoit, Beechwood	Storms developed along a pre-frontal trough around midday and moved east across the area. Storms did produce high rainfall rates, but they were moving at a fast enough pace that the overall flooding threat was limited. The main line of storms associated with the pre-frontal trough initiated along a line stretching from Lake Ontario southwest across Lake Erie into eastern Ohio. This line of storms just took off from there with bowing segments and some supracellular development occurring basically across the entire area. Multiple trees and power lines down onto Route 15 near I-390 in Rush. Extensive damage was reported along I-90 near Henrietta. A large tree fell onto a house and significant tree damage reported on I-490 at Route 96 in Bushnell Basin. A half of a dozen trees were blown down or uprooted, with a tree falling onto a house near Highway 31 in Railroad Mills. A few of the trees were snapped off about 25 feet above the ground. Several reports of trees and powerlines down were received in Irondequoit. A large tree was uprooted on Sethland Drive in Beechwood. Total property damage was an estimated \$46,000.	
December 11, 2021	High Wind	N/A	N/A	Monroe County	A strong cold front crossed the region. Selected peak wind gusts included 60 mph at Rochester Airport. Strong surface high pressure over the southern Plains amplified the pressure gradient such that a lake seiche did occur on Lake Erie with a smaller one evident on Lake Ontario, as well. Dozens of reports of trees and powerlines down were received, resulting in \$100,000 in property damage.	
March 6, 2022	High Wind	N/A	N/A	Monroe County	Low pressure tracked from the upper Great Lakes to Quebec with a trailing cold front crossing the region. Selected wind gust reports included 72 mph at the Rochester Airport. \$100,000 in property damage was reported.	
April 25, 2022	Thunderstorm Wind	N/A	N/A	Rochester Airport, Brighton, Beechwood, Fairport	A cold front advanced slowly towards western New York in the afternoon and evening with convection focused along a pre-frontal trough and an outflow boundary ahead of the main cold front. Multiple reports of wind damage were received. Trees and powerlines were reported to be down on Frost Avenue at Rochester Airport. Trees and powerlines were reported to be down on Hawthorne Street in Brighton. Numerous large tree limbs and powerlines were reported to be down in Beechwood. Trees and powerlines were reported to be down at Golf Avenue and Marsh Road in Fairport. \$9,000 in property damage was reported.	

Source: NOAA-NCEI 2022; FEMA 2022





Climate Change Impacts

Climate change is beginning to affect both people and resources in Monroe County, and these impacts are projected to continue growing. The Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the state's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2011)

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1, Western New York, Great Lakes Plain. In Region 1, it is estimated that temperatures will increase by 3.0 °F to 5.5 °F by the 2050s and 4.5 °F to 8.5 °F by the 2080s (baseline of 48.0 °F, mid-range projection). Precipitation totals will increase between 0 and 10 percent by the 2050s and 0 to 15 percent by the 2080s (baseline of 37.0 inches, mid-range projection). Table 5.4.9-5 displays the projected seasonal precipitation change for ClimAID Region 1 (NYSERDA 2014).

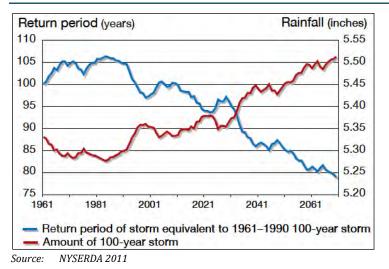
Table 5.4.9-5. Projected Seasonal Precipitation Change in Region 1, 2050s (% change)

Winter	Spring	Summer	Fall
+5 to +15	0 to +10	-5 to +10	-5 to +10
Sources NVCEDDA 2014			

Source: NYSERDA 2014

The projected increase in precipitation is expected to fall in heavy downpours and less in light rains. Downpours are very likely to increase in frequency and intensity, a change which has the potential to affect drinking water; heighten the risk of riverine flooding; flood key rail lines, roadways, and transportation hubs; and increase delays and hazards related to extreme weather events (NYSERDA 2011). Less frequent rainfall during the summer months may impact the ability of water supply systems. Increasing water temperatures in rivers and streams will affect aquatic health and reduce the capacity of streams to assimilate effluent wastewater treatment plants (NYSERDA 2011).

Figure 5.4.9-6 displays the project rainfall and frequency of extreme storms in New York State. The amount of rainfall in a 100-year event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA 2011).





Probability of Future Occurrences

Based on the historic and more recent severe storm events in Monroe County, and the future climate projections for this region, the County has a high probability of future severe storm events. It is anticipated that Monroe County will continue to experience direct and indirect impacts of severe stirn events annually that may induce secondary hazards such as infrastructure deterioration or failure, utility failures, power outages, and transportation delays, accidents and inconveniences. Additionally, climate change is expected to increase the severity and frequency of severe storm events in Monroe County. According to available record keeping, Monroe County has a 100% annual chance of occurrence of severe storm events in any given year.

Hazard Type Hail	Number of Occurrences Between 1996 and 2022 38	% chance of occurrence in any given year 100%
High Wind	63	100%
Lightning	10	38.46
Thunderstorm Wind	97	100%
Tornado	3	11.54
TOTAL	211	100%

Table 5.4.9.1-6. Probability of Future Occurrence of Severe Storm Events

Source: NOAA-NCEI 2022; FEMA 2022

Note: Disaster occurrences include federally declared disasters and selected severe storm events between January 1, 1996 and January 1, 2022. Due to limitations in data, not all severe storm events occurring between 1996 and 2022 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is underestimated.

In addition to the events listed above, six tropical cyclones have passed within 60 nautical miles of Monroe County since 1861 (2 tropical depressions, 3 tropical storms, 1 Category 1 hurricane) resulting in 3.73% chance of occurrence in any given year over the 160-year record keeping (NOAA n.d.).

Section 5.3 ranks the identified hazards of concern for Monroe County. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, the probability of occurrence for severe storms in the County is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year).

5.4.9.2 Vulnerability Assessment

A probabilistic assessment was conducted for the 100- year and 500-year MRP hurricane wind event through a Level 2 analysis in Hazus to analyze the severe storm hazard and provide a range of loss estimates due to wind impacts. Section 5.1, Methodology includes additional details on the methodology used to assess the severe storm risk.

Impact on Life, Health, and Safety

The impact of a severe weather event and wind on life, health, and safety is dependent upon several factors, including the severity of the event and whether adequate warning time was provided to residents. For the purposes of this HMP, all of Monroe County is considered vulnerable to a severe weather event and wind impacts (i.e., 753,109 persons total, US Census 2020). Hazus estimates that zero persons will be displaced from their homes or will seek shelter during a 500-year MRP hurricane wind event. Secondary impacts caused by extreme wind events include downed trees, damaged buildings, and debris carried by high winds, which can lead to injury or loss of life.





Socially vulnerable populations are most susceptible to severe weather events based on several factors, including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. Vulnerable populations include homeless persons, elderly (over 65 years old), low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. The population over the age of 65 is also more vulnerable and, physically, they may have more difficulty evacuating. They may require extra time or outside assistance during evacuations and are more likely to seek or need medical attention, which may not be available due to isolation during a storm event. According to the 5-Year 2020 American Community Survey Population Estimates, there are 127,588 persons over 65 and 100,484 persons living in poverty in Monroe County (American Community Survey 2020).

Additionally, people located outdoors (i.e., recreational activities and farming) are considered most vulnerable to hailstorms, thunderstorms, and tornadoes. This is because there is little to no warning, and shelter may not be available. Moving to a lower risk location will decrease a person's vulnerability. See Section 4, County Profile for population statistics for each participating jurisdiction.

Impact on General Building Stock

Damage to buildings is dependent upon several factors, including wind speed, storm duration, and path of the storm track. Building construction also plays a major role in the extent of damage resulting from a coastal storm. Due to differences in construction, residential structures are generally more susceptible to wind damage than commercial and industrial structures. Wood and masonry buildings, in general, regardless of their occupancy class, tend to experience more damage than concrete or steel buildings. Furthermore, high-rise buildings are also very vulnerable structures. Hazus estimates that there will be no damages in the event of a 100-year or 500-year MRP wind event.

Impact on Critical Facilities

Critical facilities are at risk of being impacted by high winds associated with structural damage or falling tree limbs/flying debris, which can result in the loss of power. Power loss can greatly impact households, business operations, public utilities, and emergency personnel. For example, vulnerable populations in Monroe County are at risk if power loss results in interruption of heating and cooling services, stagnated hospital operations, and potable water supplies. Emergency personnel such as police, fire, and emergency medical services (EMS) will not be able to effectively respond in a power loss event to maintain the safety of its citizens.

Hazus estimates the probability that critical facilities (i.e., medical facilities, fire/EMS, police, emergency operation centers [EOC], schools, and user-defined facilities such as shelters and municipal buildings) may sustain damage as a result of the 100-year or 500-year MRP hurricane wind events. Additionally, Hazus estimates the loss of use for each facility in number of days. Overall, Hazus estimates that none of the critical facilities in Monroe County are estimated to experience damage or loss of functionality due to a 100-year or a 500-year MRP hurricane wind event.

Impact on Economy

Severe storm events can have short- and long-lasting impacts on the economy. When a business is closed during storm recovery, there is lost economic activity in the form of day-to-day business and wages to employees. Overall, economic impacts include the loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss, and rental loss due to the repair/replacement of buildings.

Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-today commuting and goods transport) transportation needs. Utility infrastructure (power lines, gas lines, electrical





systems) could suffer damage and impacts can result in the loss of power, which can impact business operations and can impact heating or cooling provision to the population.

Hazus estimates the total economic loss associated with the 100-year and 500-year MRP hurricane wind events (direct building losses and business interruption losses). Direct building losses are the estimated costs to repair or replace the damage caused to the building. This is reported in the "Impact on General Building Stock" section discussed earlier. Business interruption losses are the losses associated with the inability to operate a business because of the wind damage sustained during the storm or the temporary living expenses for those displaced from their home because of the event. Hazus estimates that there would be no building and content losses in the event of a 500-year MRP wind event.

Debris management can be costly and may also impact the local economy. Hazus estimates the amount of building and tree debris that may be produced as a result of the 100-year and 500-year MRP hurricane wind events. Because the estimated debris production does not include flooding, this is likely a conservative estimate and may be higher if multiple impacts occur. According to the Hazus Hurricane User Manual, estimates of weight and volume of eligible tree debris consist of downed trees that would likely be collected and disposed at public expense. Hazus estimates that the 100-year and 500-year MRP hurricane wind event will not cause any debris for Monroe County.

Impact on the Environment

The impact of severe weather events on the environment varies, but researchers are finding that the long-term impacts of more severe weather can be destructive to the natural and local environment. National organizations such as USGS and NOAA have been studying and monitoring the impacts of extreme weather phenomena as it impacts long-term climate change, streamflow, river levels, reservoir elevations, rainfall, floods, landslides, erosion, etc. (USGS 2020). For example, severe weather that creates longer periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. Tornadoes can tear apart habitats, causing fragmentation across ecosystems. Researchers also believe that a greater number of diseases will spread across ecosystems because of impacts that severe weather and climate change will have on water supplies (NOAA 2019). Overall, as the physical environment becomes more altered, species will begin to contract or migrate in response, which may cause additional stressors to the entire ecosystem within Monroe County.

Cascading Impacts on Other Hazards

Severe weather events and severe wind events can escalate the impacts of flooding and utility failure. Severe winds can be destructive to the functionality of utilities by breaching power lines and disconnecting the utility systems. Severe weather may carry extreme rainfall that could exacerbate flooding. More information about flooding can be found in Section 5.4.5 of this HMP.

Future Changes that May Impact Vulnerability

Understanding future changes that effect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Changes in the natural environment and built environment and how they interact can also provide insight about ways to plan.

Projected Development

Any areas of growth could be potentially impacted by the severe storm hazard because the entire county is exposed and vulnerable to the wind hazard associated with severe storms. However, due to increased standards and codes, new development may be less vulnerable to the severe storm hazard compared to the aging building





stock in the county. Please refer to Section 4 and Section 9 for additional information regarding the areas targeted for future growth and development in the County.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). An increase in population will result in more of the population exposed to the sever storm hazard as it impacts the entire planning area. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

As discussed previously, the entire State of New York is projected to experience an increase in the frequency and severity of extreme storms and rainfall. Major clusters of summertime thunderstorms in North America will grow larger, more intense, and more frequent later this century in a changing climate, unleashing far more rain and posing a greater threat of flooding across wide areas (NASA 2013). Section 5.4.5, Flood, includes a discussion related to the impact of climate change due to increases in rainfall. An increase in storms will produce more wind events and may increase tornado activity. Additionally, an increase in temperature will provide more energy to produce storms that generate tornadoes (NASA 2013). With an increased likelihood of strong winds and tornado events, all the county's assets will experience additional risk for losses as a result of extreme wind events.

Changes in Vulnerability Since the 2017 HMP

Monroe County's vulnerability to severe storm events has remained unchanged. Since the 2017 HMP analysis, population statistics have been updated using the 2020 Census. The general building stock and the 2017 critical facility dataset was updated by the County and participating jurisdictions. Overall, this vulnerability assessment uses a more accurate and updated building inventory than that used in the 2017 HMP.





5.4.10 Severe Winter Storm

This section provides a profile and vulnerability assessment of the severe winter storm hazard for Monroe County.

5.4.10.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the severe winter storm hazard.

Hazard Description

A winter storm is a weather event in which the main types of precipitation are snow, sleet, or freezing rain. They can be a combination of heavy snow, blowing snow, and dangerous wind chills. According to the National Severe Storms Laboratory (n.d.), the three basic components needed to make a winter storm include the following:

- Below freezing temperatures (cold air) in the clouds and near the ground to make snow and ice.
- Lift, something to raise the moist air to form clouds and cause precipitation, such as warm air colliding with cold air and being forced to rise over the cold dome or air flowing up a mountainside (oliographic lifting).
- Moisture to form clouds and precipitation, such as air blowing across a large lake or the ocean (NOAA 2021).

Some winter storms can immobilize an entire region, while others might only affect a single community. Winter storms typically are accompanied by low temperatures, high winds, freezing rain or sleet, and heavy snowfall. The aftermath of a winter storm can have an impact on a community or region for days, weeks, or even months; potentially causing cold temperatures, flooding, storm surge, closed and blocked roadways, downed utility lines, and power outages. Monroe County's winter storms include blizzards, snowstorms, and ice storms. Extreme cold temperatures and wind chills are associated with winter storms. For more information on extreme cold temperatures, refer to the Section 5.4.4. (Extreme Temperature).

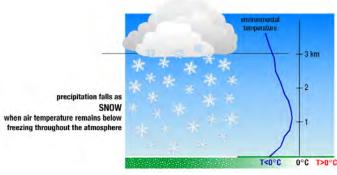
Heavy Snow

According to the National Snow and Ice Data Center (NSIDC), snow is precipitation in the form of ice crystals. It originates in clouds when temperatures are below the freezing point (32 °F) and water vapor in the atmosphere condenses directly into ice without going through the liquid stage. Once an ice crystal has formed, it absorbs and freezes additional water vapor from the surrounding air, growing into snow crystals or a snow pellet, which then falls to the earth. Snow falls in different forms: snowflakes, snow pellets, or sleet. Snowflakes are clusters of ice crystals that form from a cloud. Figure 5.4.10-1 depicts snow creation.





Figure 5.4.10-1. Snow Creation



Source: NOAA-NSSL 2015

Snow pellets are opaque ice particles in the atmosphere. They form as ice crystals fall through super-cooled cloud droplets, which are below freezing but remain a liquid. The cloud droplets then freeze to the crystals.

Sleet

Sleet is made up of drops of rain that freeze into ice as they fall through colder air layers. They are usually smaller than 0.30 inches in diameter (NSSL 2021). Figure 5.4.10-2 depicts snow creation.

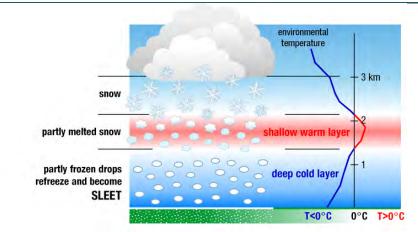


Figure 5.4.10-2. Sleet Creation

Source: NOAA-NSSL 2020

Blizzards

A blizzard is a winter snowstorm with sustained or frequent wind gusts of 35 miles per hour (mph) or more, accompanied by falling or blowing snow reducing visibility to or below 0.25 mile, as the predominant conditions over a 3-hour period. Extremely cold temperatures often are associated with blizzard conditions but are not a formal part of the definition. The hazard, created by the combination of snow, wind, and low visibility, significantly increases when temperatures are below 20 °F. A severe blizzard is categorized as having temperatures near or below 10 °F, winds exceeding 45 mph, and visibility reduced by snow to near zero. Storm systems powerful enough to cause blizzards usually form when the jet stream dips far to the south, allowing cold air from the north to clash with warm, moister air from the south. Blizzard conditions often develop on the northwest side of an intense storm system. The difference between the lower pressure in the storm and the higher pressure to the west creates a tight pressure gradient, resulting in strong winds and extreme conditions caused by the blowing snow (Lam 2019).

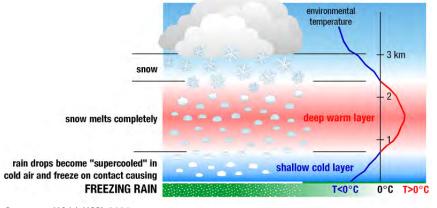




Ice Storms

An ice storm describes those events when damaging accumulations of ice are expected during freezing rain situations. Significant ice accumulations typically are accumulations of 0.25-inches or greater (NWS 2013). Heavy accumulations of ice can bring down trees, power lines, utility poles, and communication towers. Ice can disrupt communications and power for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians (Dolce 2012). Figure 5.4.10-3 depicts freezing rain creation.





Source: NOAA-NSSL 2020

Location

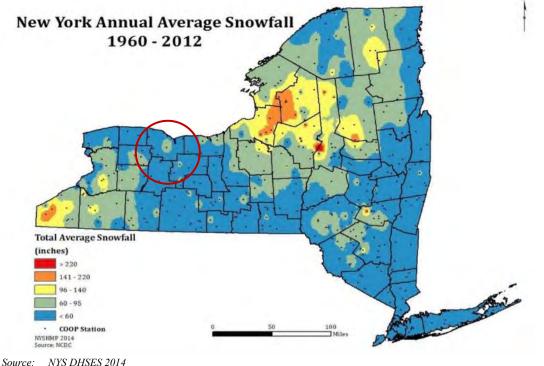
The climate of New York State is marked by abundant snowfall. Winter weather can reach New York State as early as October and is usually in full force by late November with average winter temperatures between 20 and 40 F. The inland regions of New York State receive more snow than most other communities in the nation. Although the entire state is subject to winter storms, the easternmost and west-central portions of the state are more likely to suffer under winter storm occurrences than any other location (NYS DHSES 2019). With the exception of coastal New York State, the state receives an average seasonal amount of 40 inches of snow or more. The average annual snowfall is greater than 70 inches over 60 percent of New York State's area, with Monroe County's averages less than 60 to 95 inches annually. The City of Rochester is typically in the top ten cities in the nation in annual snowfall (NYS DHSES 2019). According to the Northeast Regional Climate Center, average annual snowfall in Rochester is 93.4 inches (Northeast Regional Climate Center 2009).

Figure 5.4.10-4, an annual average snowfall map, illustrates the annual average snowfall totals over a 50-year period for New York State.





Figure 5.4.10-4. New York Annual Average Snowfall, 1960-2012



Source: NYS DHSES 2014 Note: The red circle indicates the location of Monroe County

Extent

The magnitude or severity of a severe winter storm depends on several factors, including snowfall rates, regional climatological susceptibility to snowstorms, snowfall amounts, wind speeds, temperatures, visibility, storm duration, topography, time of occurrence during the day and week (e.g., weekday versus weekend), and time of season.

The extent of a severe winter storm can be classified both by meteorological measurements and by evaluating societal impacts. The National Oceanic and Atmospheric Administration's (NOAA's) National Climatic Data Center (NCDC) is currently producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from 1 to 5 and is based on the spatial extent of the storm, the amount of snowfall, and the interaction of the extent and snowfall totals with population. The NCDC has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA n.d.). Table 5.4.10-1. presents the five RSI ranking categories.

Table 5.4.10-1. RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1–3
2	Significant	3–6
3	Major	6–10
4	Crippling	10–18
5	Extreme	18.0+

Source: NOAA 2020 Note: RSI = Regional Snowfall Index





The NWS operates a widespread network of observing systems, such as geostationary satellites, Doppler radars, and automated surface observing systems that feed into the current state-of-the-art numerical computer models to provide a look into what will happen next, ranging from hours to days. The models are then analyzed by NWS meteorologists who then write and disseminate forecasts. According to NWS (NWS 2021), the magnitude of a severe winter storm can be qualified into five main categories by event type:

Table 5.4.10-2. Winter Storm Category Thresholds

Heavy Snowstorm	Accumulations of 4 inches or more of snow in a 6 hour period, or 6 inches of snow in a 12-hour period.
Sleet Storm	Significant accumulations of solid pellets that form from the freezing of raindrops or partially melted snowflakes causing slippery surfaces, posing a hazard to pedestrians and motorists.
Ice Storm	Significant accumulation of rain or drizzle freezing on objects (trees, power lines, roadways) as it strikes them, causing slippery surfaces and damage from sheer weight of ice accumulations.
Blizzard	Wind velocity of 35 mph or more, temperatures below freezing, considerable blowing snow with visibility frequently below one-quarter mile prevailing over an extended period.
Severe Blizzard	Wind velocity of 45 mph, temperatures of 10 °F or lower, a high density of blowing snow with visibility frequently measured in feet prevailing over an extended period.
Source: NWS 2021	

Additionally, the NWS uses winter weather watches, warnings, and advisories to help people anticipate what to expect in the days and hours prior to an approaching storm (NWS 2021). Refer to Figure 5.4.10.1-5 for the warning thresholds.

Figure 5.4.10.1-5. Winter Storm Warning Thresholds



Source: NWS 2021





Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with severe winter storms throughout New York State and Monroe County; therefore, the loss and impact information for many events varies depending on the source. The accuracy of monetary figures discussed is based on the available information in cited sources.

FEMA Major Disaster and Emergency Declarations

Between 1953 and 2022, New York State was included in 22 FEMA declared disasters (DR) or emergency declarations (EM) that involved snow or ice storms. Monroe County was included in six of these 22 severe winter weather-related declarations (Table 5.4.10-1).

Table 5.4.10-3. FEMA DR and EM Declarations for Severe Winter Storm Events in Monroe County, 1954to 2022

FEMA Declaration Number	Date(s) Of Event	Event Type	Details
DR-494	March 19, 1976	Ice Storm, Severe Storms, Flooding	New York Ice Storm, Severe Storms, Flooding
DR-898	March 3-4, 1990	Severe Winter Storm	New York Severe Storm, Winter Storm
EM-3107	March 13-17, 1993	Severe Blizzard	New York Severe Blizzard
DR-1196	January 5-17, 1998	Severe Storms and Flooding	New York Severe Winter Storms
EM-3138	March 3-6, 1999	Snow	New York Winter Storm
DR-1467	April 3-5, 2003	Ice Storm	New York Ice Storm

Source: FEMA 2022

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was not included in any USDA-designated agricultural disasters that included severe winter storm events (USDA 2022).

Previous Events

Table 5.4.10-4 identifies the known severe winter storm events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix E (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.10-4. Severe Winter Storm Events in Monroe County, 2015 to 2022

Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts	
February 1-2, 2015	Winter Storm	Monroe County	N/A	N/A	Low pressure brought a general eight to fourteen inches of snow to the entire region. Heaviest amounts were along the southern tier counties and over the counties along the south shore of Lake Ontario. Northeast winds became quite strong near Lake Ontario with near blizzard conditions occurring closer to the shore. While the snow did not result in many closings the general snow across the entire region did result in many delays and late openings. Specific snowfall reports included: 17 inches at Webster; and 16 inches at Greece and Oswego	
February 9, 2015	Winter Storm	Monroe County	N/A	N/A	Low pressure brought a light general snowfall to the area. The northerly flow crossing the warmer waters of Lake Ontario and higher elevations resulted in enhanced snowfall amounts across parts of the Genesee Valley and northern Finger Lakes. Given the harsh winter conditions, the effects of this storm on the region were generally minimal with just some delays and longer travel times. Specific snowfall reports included 12 inches near Rochester.	
February 14-15, 2015	Winter Storm	Monroe County	N/A	N/A	A strong clipper crossed the Great Lakes and brought snow and blowing snow to the region and some of the coldest air of the season. The snowfall amounts were enhanced downwind of Lake Ontario and upslope east of Lake Erie where snowfall amounts around a foot were recorded. Gusty winds accompanied the system and produced reduced visibilities in blowing snow. On the back side of the system, temperatures plummeted and struggled to reach zero on Sunday the 15th. Combined with the winds, wind chill temperatures of minus 25 to minus 35 degrees F were recorded.	
January 18-19, 2016	Lake- Effect Snow	Monroe County	N/A	N/A	Lake effect snow, arctic air flowed over the eastern Great Lakes Sunday, January 17th, with early weekend air temperatures in the 40s plummeting back below freezing. The lake effect snows began during the morning. This northwest flow over Lake Ontario continued varying intensity to the snow bands through the night and into Tuesday, with subtle variations in the wind flow carrying the snows over the southern and southeastern shorelines Specific storm totals off Lake Ontario included 13 inches at Irondequoit.	
February 10-11, 2016	Lake- Effect Snow	Monroe County	N/A	N/A	A west wind brought the steadiest snows east of Lake Erie across ski country through the day, while on the southwestern shoreline of Lake Ontario a band of snow hugged the shoreline, dropping upwards of a half a foot of snow.	
February 15-16, 2016	Winter Storm	Monroe County	N/A	N/A	Low pressure moved north across central Pennsylvania and central New York. It was on the only major synoptic event of the winter. This brought all snow to western New York. Across central New York what started initially as snow changed to rain Tuesday morning (16th) then back to snow for the evening hours. Across the north country minor snow accumulations accompanied up to a half inch of ice. The axis of heaviest snow (eighteen to twenty-two inches) fell across the Monroe county and the City of Rochester. The heavy snow began to fall during the early morning hours bringing the morning commute to a standstill.	
November 20-22, 2016	Lake- Effect Snow	Monroe County	N/A	N/A	A strong cold front moved across the Lower Great Lakes creating marginally cold temperatures. Lake enhanced snow covered a much larger area than typical lake effect snow events. The most persistent lake enhanced snow was found east and southeast of Lake Ontario with storm totals of over one foot in a large area from Rochester eastward to the Tug Hill region. Snowfall reports off Lake Ontario included 16 inches at Fairport and 15 inches at Rochester.	





Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts	
December 15-16, 2016	Lake- Effect Snow	Monroe County	N/A	N/A	A cold front moved through the region, with the wind direction from the southwest initially developing lake effect snow. Lake Ontario experiences the heaviest snow period during the morning of the 15 th . Following the passage of the arctic front, winds become more northwest, with a band of heavy snow settling south into the Rochester area during the late afternoon and evening. The combination of heavy snow and gusty winds brought a difficult afternoon and evening drive in the Rochester area. Heavy lake effect snow persisted through much of the night on the 15th for Rochester. Lake Ontario, specific snowfall reports included: 14 inches at Rochester Airport, 10 inches at Irondequoit and Webster.	
February 9-10, 2017	Lake- Effect Snow	Monroe County	N/A	N/A	Lake effect snow developed behind a departing coastal nor'easter as cold air spilled across the region on a northwesterly flow. The northwesterly flow became perfectly aligned from Lake Superior across the Georgian Bay to Lake Ontario Thursday night into Friday morning. This helped to organize and lock-in an intense single band of lake effect snow that came on shore in northeast Monroe County. Specific snowfall reports included 8 inches in Webster.	
December 12-13, 2017	Winter Storm	Monroe County	N/A	N/A	A general snow across the region was enhanced by the Great Lakes before transitioning to lake effect snow bands east and southeast of the lakes. The lake effect snow taper off and ended by late Wednesday. Off Lake Ontario, synoptic snow became lake enhanced on Tuesday and Tuesday night, before transitioning to purely lake effect snow by late Tuesday night through Wednesday. A robust lake effect snow plume was centered on the Tug Hill under a westerly flow with snowfall rates exceeding 2 inches per hour. Overnight, winds became northwest and pushed this band to the south, breaking it apart into multi-bands on a northwest flow. The lake effect snow ended Wednesday night. Snowfall amounts were generally highest toward the southeast corner of Lake Ontario, which saw the most persistent lake enhancement of snowfall.	
December 29-30, 2017	Lake- Effect Snow	Monroe County	N/A	N/A	Tea kettle bands of lake effect snow developed offshore over Lake Erie and Lake Ontario for an extended period of time prior to moving onshore, first on Lake Erie and eventually on Lake Ontario. By early evening, the entire band moved onshore as an arctic front crossed the lake. The lake effect snow diminished to flurries and light snow showers by midday on the 31st. Specific snowfall reports included: 8 inches at Greece.	
January 4- 6, 2018	Lake- Effect Snow	Monroe County	N/A	N/A	The heaviest lake effect snow fell at the beginning of this event during the evening of the 4th as an arctic front slowly crossed Lake Ontario and merged with a band of lake effect snow from Rochester to southern Oswego County. Snowfall rates reached 2 inches per hour at times for a few hours during the evening from the Monroe County shoreline. Specific snowfall reports included:12 inches at Webster and 8 inches at Irondequoit.	
January 12-13, 2018	Winter Storm	Monroe County	N/A	N/A	A developing winter storm brought first a wintry mix of precipitation during the evening of the 12th and then heavy snow through the morning of the 13th. Rain changed to a mix of freezing rain and snow during the evening. Ice accumulations up to a tenth of an inch were reported along the lake shore counties. Once the precipitation changed to snow, the heavy snow fell at one to two inches an hour during the overnight hours. Travel was difficult especially on untreated roads as the snow covered the ice below. Winds gusting to 35 mph at times caused areas of blowing and drifting snow.	
November 15-16, 2018	Winter Storm	Monroe County	N/A	N/A	A complex system moved into the area with wildly varying thermal profiles. An initial mid-level trough and surface low moved across the southeast United States that gave way to secondary cyclogenesis near the southern tip of the Delmarva. The secondary low then moved northward along the east coast to the Gulf of Maine. The system had very marginal cold air to work with, particularly in western New York. As	





Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts	
					the event unfolded, precipitation type was mostly snow from Rochester eastward, with just a few brie periods of sleet. More sleet and some freezing rain mixed in through the first half of the event across fa western New York, cutting back on snow accumulation there.	
April 14- 15, 2018	Ice Storm	Monroe County	N/A	N/A	Two rounds of mixed winter precipitation moved over the area with warm air aloft overriding a deep layer of cold air at the surface. This resulted in sleet initially that transitioned to freezing rain before temperatures eventually increased above freezing. Several areas saw nearly an inch of sleet combined with around one half of an inch of freezing rain. This resulted in thousands of power outages and substantial tree damage.	
January 1- 20, 2019	Winter Storm	Monroe County	N/A	N/A	A system tracked along the New York/Pennsylvania line and spread heavy snow across our region over the weekend. The low pressure track fit perfectly with climatology for widespread heavy snow in our area. The heaviest amounts that model solutions generally had across the western Southern Tier ended up being across the entirety of the Thruway corridor, resulting in over a foot of snow for much of the area. Northeasterly flow off of Lake Ontario resulted in localized maxima along the southwestern shore of the lake, as well. Even with more than a foot of snow, impacts were not as severe as they would otherwise have been because all of the snow fell over a weekend, resulting in lower impacts to transportation.	
February 27, 2019	Winter Storm	Monroe County	N/A	N/A	Snow developed across the area south of Lake Ontario as a surface low translated across Pennsylvania. The heaviest snow generally fell along the Thruway corridor during the daytime hours of February 27. This snow impacted both the morning and evening commutes with up to 1 inch per hour snowfall rates. Most areas received between 4 and 7 inches, however local daytime accumulation in the northern Finger Lakes and Rochester area slightly exceeded these values.	
November 11-12, 2019	Winter Storm	Monroe County	N/A	N/A	A cold front moved slowly south across the area and stalled just south of the area. A deep upper level trough became carved out in the flow over the Upper Great Lakes, which forced a strong wave to develop along the stalled frontal zone just south of our area. Frontogenesis to the north of the low track and just north of the stalled frontal zone acted as a focus for moderate to heavy snow. Model guidance with this system trended south and weaker before trending back north and stronger. Winter storm watches and warnings were issued for much of the area, but the heavy snow ended up being a bit farther north and west than had been warned for.	
January 22-23, 2021	Lake- Effect Snow	Monroe County	N/A	N/A	Weakening low pressure system passed to our north across Ontario and Quebec. This provided large scale moisture that when combined with pre-frontal temps aloft just cold enough to support lake effect resulted in snow east of Lake Ontario. Upslope initially aided the combined synoptic moisture and lake-induced instability to generate heavy snow in the Tug Hill region. This resulted in heavy snow sinking southward in the Monroe County to Cayuga County shoreline. Selected snow totals included 10 inches in Gates and 9 inches in Webster.	
February 2-3, 2021	Winter Storm	Monroe County	N/A	N/A	A stacked coastal storm threw Atlantic moisture back across western and north central New York Tuesday (Groundhog Day) and into Wednesday. Strong mesoscale banding occurred over the North Country and on the western edge of the mid-upper level low. Later, banding within the shield of synoptic snow enhanced snowfall rates to over an inch an hour for sites Rochester and eastward with total snowfall approaching 10 -12 inches in some areas. The Rochester evening commute was slow with snow covered roads.	





Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
February 15-16, 2021	Winter Storm	Monroe County	N/A	N/A	A deep trough dug across the nation's midsection with an outbreak of Arctic air from the Great Plains to Texas. Low pressure developed near Louisiana and tracked across Pennsylvania toward southern New England on the eastern fringe of the cold air mass. A weaker initial wave of precipitation produced 1-3 inches of snow with a lull before the main event with deeper moisture, isentropic lift, and favorable jet dynamics arrived later in the day on February 15. While most of the area was originally forecast to see heavy snow, large scale drying aloft encroached from the south. This resulted in far less snow over the Southern Tier and from the Genesee Valley eastward.
January 16-17, 2022	Winter Storm	Monroe County	N/A	N/A	Low pressure across the Carolinas rapidly intensified to 980 hPa as it tracked across eastern Pennsylvania and New York. This brought a deepening surface low track inland of the coast and the climatologically favored baroclinic zone along the periphery of the Gulf Stream. Other than the unusual track, it was a classic Nor'easter driven by a strong closed low across the southeast interacting with a longwave trough. Forcing for ascent was supported by strong differential vorticity advection ahead of the sharp mid-level closed low, impressive upper level coupled jet structure, and strongly diffluent flow aloft. A very strong southeasterly low level jet supported a strong warm conveyor belt, which resulted in a clearly defined deformation zone developing northwest of the storm early on January 17 and lingering over much of western New York with extreme snowfall rates for several hours.
February 2-4, 2022	Winter Storm	Monroe County	N/A	N/A	A frontal boundary slowly sagged southward through the area. This allowed for deep cold air to make its way south of the Pennsylvania state line. A series of weak disturbances then worked down this front bringing several rounds of moderate to heavy snow. The heaviest snow fell in the evening of February 3 for most areas. This occurred after a slow changeover from rain to snow as the front sagged southward. By the end of the event, many portions of the area received more than a foot of snow.

Source: NOAA NCEI 2022; FEMA 2022; NYS DHSES 2019





Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to increase. The impacts related to increasing temperatures and sea level rise are already causing complications in the state. *ClimAID: The Integrated Assessment for Effective Climate Change in New York State (ClimAID)* was undertaken to provide decision-makers with information on the state's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2011/2014).

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2–3.4 °F by the 2020s, 4.1–6.8 °F by the 2050s, and 5.3–10.1 °F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the state (NYSERDA 2011/2014).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1 (Western New York and the Great Lake Plains), where temperatures are estimated to increase by 4.3 to 6.3°F by the 2050s and 5.7 to 9.6°F by the 2080s (baseline of 47.7°F, middle range projection). Precipitation totals are estimated to increase between four to ten percent by the 2050s and four to thirteen percent by the 2080s (baseline of 34.0 inches, middle range projection). Table 5.4.1010-44 displays the projected seasonal precipitation change for the region for 2050 (NYSERDA 2011/2014). The winter season is projected to have a precipitation increase of 5-15 percent.

Table 5.4.1010-4. Projected Seasonal Precipitation Change in Region 2, 2050s (% change)

Winter	Spring	Summer	Fall
+5 to +15	0 to +15	-10 to +10	-5 to +10

Source: NYSERDA 2014

New York State already is experiencing the effects of climate change during the winter season. Annual ice cover has decreased 71 percent on the Great Lakes since 1973. This decrease may lead to increased lake-effect snow in Erie County in the next two decades through greater moisture availability. By mid-century, however, lake-effect snow will generally decrease as temperatures below freezing become less frequent. Winter snow cover is decreasing, and spring comes, on average, about a week earlier than it did a few years ago. Nighttime temperatures are measurably warmer, even during the colder months. Overall winter temperatures in New York State are almost 5 degrees warmer than in 1970 (NYSERDA 2011/2014). The state has experienced a decrease in the number of cold winter days (below 32 °F) and can expect to see a decrease in snow cover by as much as 25–50 percent by end of the next century. The lack of snow cover may jeopardize opportunities for skiing, snowmobiling, and other types of winter recreation; and natural ecosystems will be affected by the changing snow cover (Cornell University College of Agriculture and Life Sciences 2011).

As the century progresses, snowfall is likely to become less frequent, with the snow season decreasing in length. It is uncertain if there will be changes in the intensity of snowfall during each storm; however, it is possible that higher temperatures in colder parts of New York State could support higher snowfall totals during snowstorm events (NYSERDA 2011/2014).

Probability of Future Occurrences

Based on geography, location, past event history, and climate projections, Monroe County will continue to experience winter storm events.





Table 5.4.10-5. summarizes data regarding the probability of occurrences of severe winter storm events in Monroe County based on the historic record. Heavy snow events and winter storms are the first and second most common in Monroe County, respectively. The information used to calculate the probability of occurrences is based solely on NOAA-NCEI storm events database results.

Hazard Type	Number of Occurrences Between 1996 and 2022	% chance of occurrence in any given year
Blizzard	2	7.41%
Heavy Snow	39	100%
Ice Storm	4	14.8%
Winter Storm	30	100%
Winter Weather	1	3.7%
TOTAL	76	100%

Table 5.4.10-5. Probability of Future Occurrence of Severe Winter Weather Events in Monroe County

Source: NOAA-NCEI 2022

Note: Disaster occurrences include federally declared disasters and selected winter storm events between January 1, 1996 and January 1, 2022. Due to limitations in data, not all winter storm events occurring between 1996 and June 2022 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is underestimated.

Based on historical data from NYSERDA (2014), it is expected that the following will occur at least once per 100 years:

- Up to four inches of freezing rain in the ice band near central New York State of which between 1–2 inches of accumulated ice will occur over a 24-hour period.
- Up to two feet of accumulated snow in the snow band in northern and western New York State over a 48-hour period.

Section 5.3 ranks the identified hazards of concern for Monroe County. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, the probability of occurrence for severe winter storm in the County is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year).

5.4.10.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the severe winter storm hazard, all of Monroe County has been identified as the hazard area. Therefore, all assets in the County (population, structures, critical facilities and lifelines), as described in the County Profile (Section 4), are vulnerable to a winter storm event.

Impact on Life, Health and Safety

The entire population of Monroe County (753,109) is exposed to severe winter storm events (US Census 2020). According to the NOAA National Severe Storms Laboratory (NSSL); every year, winter weather indirectly and deceptively kills hundreds of people in the U.S., primarily from automobile accidents, overexertion and exposure. Winter storms are often accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, drifting snow and extreme cold temperatures and dangerous wind chill. They are considered deceptive killers because most deaths and other impacts or losses are indirectly related to the storm. People can die in traffic accidents on icy roads, heart attacks while shoveling snow, or of hypothermia from prolonged exposure to cold (NSSL 2021).





The homeless and elderly are considered most susceptible to this hazard. The elderly are considered susceptible to this hazard due to their increased risk of injuries and death from falls and overexertion and/or hypothermia from attempts to clear snow and ice. According to the 2020 American Community Survey 5-Year population estimate, there are 127,588 persons over 65 years old that reside in the County that are considered vulnerable to severe winter weather (16.9 percent of the County population). In addition, severe winter storm events can reduce the ability of these populations to access emergency services

Impact on General Building Stock

The entire general building stock inventory is exposed and vulnerable to the severe winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. As an alternate approach, this plan considers percent damages that could result from severe winter storm conditions. This allows planners and emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Given professional knowledge and the currently available information, the potential loss for this hazard is many times considered to be overestimated because of varying factors (building structure type, age, load distribution, building codes in place, etc.). Therefore, the following information should be used as estimates only for planning purposes with the knowledge that the associated losses for severe winter storm events vary greatly.

Impact on Critical Facilities

Full functionality of critical facilities such as police, fire, and medical facilities is essential for response during and after a severe winter storm event. These critical facility structures are largely constructed of concrete and masonry; therefore, they should only suffer minimal structural damage from severe winter storm events. Because power interruption can occur, backup power is recommended. Infrastructure at risk for this hazard includes roadways that could be damaged from the application of salt and intermittent freezing and warming conditions that can damage roads over time. Severe snowfall requires clearing of roadways and alerting of citizens to dangerous conditions; following the winter season, resources for road maintenance and repair are required.

Impact on Economy

The cost of snow and ice removal and repair of roads from the freeze/thaw process can drain local financial resources. In addition to snow removal costs, severe winter weather affects the ability of persons to commute into and out of the area for work or school. The loss of power and closure of roads prevents the commuter population traveling to work within and outside of the County and may cause a loss in economic productivity.

Impact on the Environment

Severe winter weather can have a major impact on the environment. Not only does winter weather create changes in natural processes, the residual impacts of a community's methods to maintain its infrastructure through winter weather maintenance may also have an impact on the environment. For example, an excess amount of snowfall and earlier warming periods may affect natural processes such as flow within water resources (USGS 2020). Rain-on-snow events can also exacerbate runoff rates with warming winter weather. Consequentially, these flow rates and excess volumes of water can erode banks, tear apart habitat along the banks and coastline, and disrupt terrestrial plants and animals.

Cascading Impacts on Other Hazards

Severe winter weather events may exacerbate flooding. As discussed, the freezing and thawing of snow and ice associated with winter weather events can create major flooding issues in the County. Maintaining winter





weather hazards through snow and ice removal could minimize the potential risk of flooding during a warming period. Refer to 5.4.5 (Flood) for more information about the flood hazard of concern.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth located could be potentially impacted by severe winter storm events. Current New York State land use and building codes incorporate standards that address and mitigate snow accumulation. Some local municipalities in the State have implemented the following activities to eliminate loss of life and property and infrastructure damages during winter storm events:

- Removal of snow from roadways
- Removal of dead trees and trim trees/brush from roadways to lessen falling limbs and trees
- Ensure proper road signs are visible and installed properly
- Bury electrical and telephone utility lines to minimize downed lines
- Removal of debris/obstructions in waterways and develop routine inspections/maintenance plans to reduce potential flooding
- Replace substandard roofs of critical facilities to reduce exposure to airborne germs resulting from leakage
- Purchase and install backup generators in evacuation facilities and critical facilities to essential services to residents
- Install cell towers in areas where limited telecommunication is available to increase emergency response and cell phone coverage (NYS DHSES 2019).

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Any increase in growth can create changes in density throughout the County, which may impact the ability of persons in the County to mobilize or receive essential services during severe winter storm events. Historically, winter weather events with associated snowfall and ice accumulation have severely impacted transportation corridors as well as infrastructure. Refer to Section 4 (County Profile), which includes a more thorough discussion about population trends for the County.

Climate Change

As discussed above, most studies project that the State of New York will see an increase in average annual temperatures and precipitation. Annual precipitation amounts in the region are projected to increase, primarily in the form of heavy rainfalls, which have the potential to freeze into heavy snowfall and icing. This increase in snow and ice could result in an increased risk to life and health, an increase in structural losses, a diversion of





additional resources to response and recovery efforts, and an increase in business closures affected by severe winter events due to loss of service or access.

Change of Vulnerability Since 2017 HMP

Monroe County remains vulnerable to severe winter storm events. Since the 2017 analysis, population statistics have been updated using the 2020 US Census. Additionally, this updated analysis estimated exposure and losses at the structure level with updated building stock data. The general building stock was updated using building stock data provided by the County to update the user-defined facility inventory and critical facility inventory dataset.

Overall, this vulnerability assessment uses a more accurate and updated building inventory which provides more accurate estimated exposure and potential losses for Monroe County.





5.4.11 WILDFIRE

This section provides a profile and vulnerability assessment of the wildfire hazard for Monroe County.

5.4.11.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the wildfire hazard.

Hazard Description

Wildfire is defined as an uncontrolled fire spreading through natural or unnatural vegetation that can threaten lives and property if not contained. Wildfires are commonly termed forest fires, brush fires, grass fires, wildlandurban interface fires, range fires, or ground fires. Wildfires do not include fires naturally or purposely ignited to manage vegetation for one or more benefits (NYS DHSES 2019). Although destructive fires do not occur annually, the State's fire history shows a cycle of outbreaks that have caused human death, property loss, forest destruction, and air pollution (NYS DHSES 2019).

Location

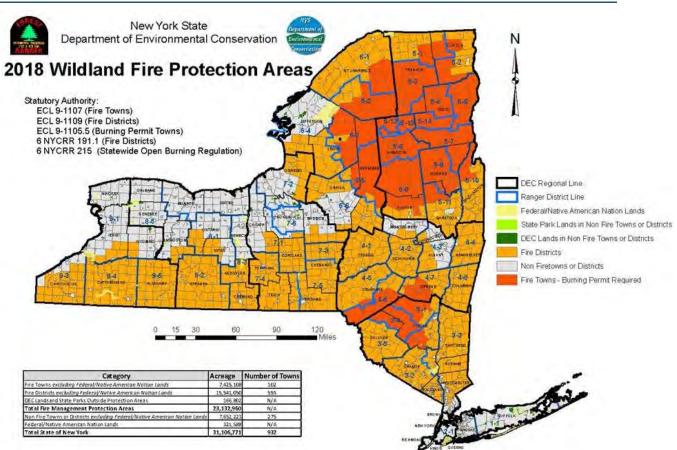
According to the U.S. Fire Administration (USFA), the fire problem in the United States varies from region to region. This variation often is a result of climate, poverty, education, demographics, and other causal factors (USFA 2015). Wildfires do occur in Monroe County. Many areas in the County, particularly those that are heavily forested or contain large tracts of brush and shrubs, are prone to fires (NYSDEC 2015).

In New York State, the NYSDEC's Division of Forest Protection (Forest Ranger Division) is designated as the state's lead agency for wildfire mitigation. The Forest Ranger Division has a statutory requirement to provide a forest fire protection system for 657 of the 932 jurisdictions throughout New York State. This jurisdiction includes cities and villages and covers 23.1 million acres of land, including all state-owned land outside of the jurisdictions. The Lake Ontario Plains and New York City-Long Island areas are the general areas not under the statutory requirement. Records on wildfires in this area are collected from fire department reports to evaluate any need to expand statutory responsibilities. displays the fire protection areas in New York State. Figure 5.4.11-1 indicates that, as of 2018, Monroe County is not part of the wildfire protection area. Figure 5.4.11-2 shows the Forest Ranger Divisions in New York State. Monroe County is part of Forest Ranger Division 8 (NYSDEC 2022).





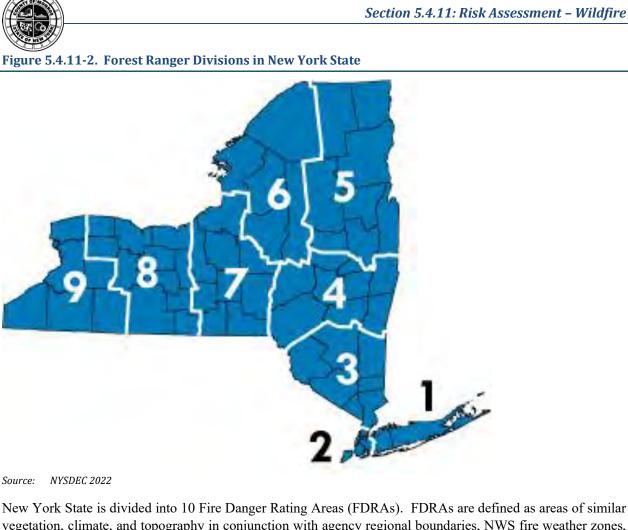




Source: NYSDEC 2018





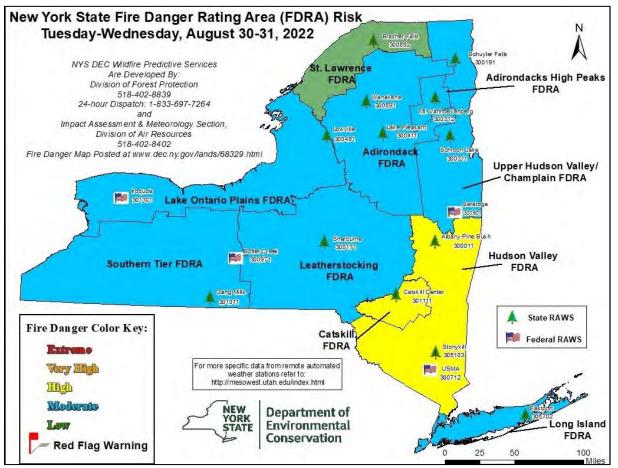


vegetation, climate, and topography in conjunction with agency regional boundaries, NWS fire weather zones, political boundaries, fire occurrence history, and other influences. Monroe County is part of the Lake Ontario Plains FDRA. The Forest Ranger Division issues daily fire danger warnings when the fire danger rating within one or more FDRAs is at "high" or above. A current fire danger rating map is updated daily on the NYSDEC website. Figure 5.4.11-3 shows an example of this map.





Figure 5.4.11-3. New York State Fire Danger Rating Areas



Source: NYSDEC 2022

Wildfire/Urban Interface (WUI) in New York State/Monroe County

The wildland/urban interface (WUI) is any location where human structures and woodlands intermingle, allowing a wildland fire to reach beyond trees, brush, and other natural fuels to ignite homes and their immediate surroundings (NYSDEC n.d.). The WUI can also be subdivided into three categories: intermix, interface, and occluded / interior (Sustainable Defensible Space n.d.). The NYS HMP indicates that New York State has all three types of WUI interfaces. The Adirondack and Catskill Mountains contain large tracts of forests with the mixed, and to a lesser extent, the classic interface occurring throughout. The remainder of the state contains classic and mixed interfaces, with some major cities containing an occluded interface. Population migration from urban to suburban and rural living will continue, increasing the possibility of loss or damage to structures in the WUI, for a number of reasons. Many property owners are unaware that a threat from a wildfire exists or that their homes are not defensible from it. Water supplies at the scene in the WUI are often inadequate. Access by firefighting equipment is often blocked or hindered by driveways that are narrow, winding, dead-ended, have tight turning radii, or have weight restrictions. Most wildland fire suppression personnel are inadequately prepared for fighting structural fires, and local fire departments are not usually fully trained or equipped for wildfire suppression. Furthermore, the mix of structures, ornamental vegetation, and wildland fuels may cause erratic fire behavior. These factors and others substantially increase risk to life, property, and economic welfare in the WUI. While many interface communities are present throughout New York State and Monroe County, an





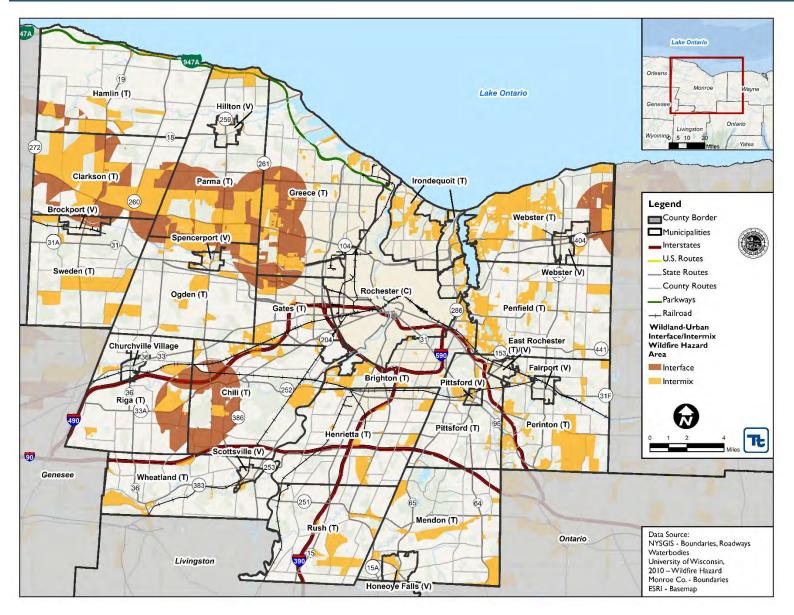
official list that details the location, type of interface, and surrounding fuel makeup does not exist (NYS DHSES 2011).

A detailed WUI (interface and intermix) that also defines the wildfire hazard area was obtained through the SILVIS Laboratory, Department of Forest Ecology and Management, University of Wisconsin – Madison. The California Fire Alliance determined that areas within 1.5 miles of wildland vegetation are the approximate distance that firebrands can be carried from a wildland fire to the roof of a house. Therefore, even structures not located within the forest are at risk from wildfire. This buffer distance, along with housing density and vegetation type, were used to define the WUI illustrated on Figure 5.4.11-4 below (Radeloff 2018). Specifically, significant portions of land area in the Towns of Clarkson, Parma, Greece, Webster, Chili, and Riga are within the WUI interface/intermix, as shown in Figure 5.4.11-4.





Figure 5.4.11-4. WUI in Monroe County







Wildfire events can range in size and intensity. A wildfire's intensity depends significantly on both meteorological conditions and human activity.

Wildfire Behavior and Fire Ecology

Fire behavior is defined as the way fuel ignites, flame develops, and fire spreads, which depend on interactions among fuel, weather, and topography. Fire behavior is one of the most important aspects of wildfires because almost all actions in response to a fire depend on how it behaves. The extent to which fire manages can understand and predict fire behavior relies on success in pre-suppression planning and actual suppression of wildfires.

Potential for wildfire and its subsequent development (growth) and severity are controlled by the three principal factors of topography, fuel, and weather, described as follows:

Topography – Topography can powerfully influence wildfire behavior. Movement of air over the terrain tends to direct a fire's course. A gulch or canyon can funnel air and act as a chimney, intensifying fire behavior and inducing faster spread. Saddles on ridgetops tend to offer lower resistance to passage of air and draw fires. Solar heating of drier, south-facing slopes produces upslope thermal winds that can complicate behavior. Slope is an important factor. If the percentage of uphill slope doubles, the rate the wildfire spreads will most likely double as well. Terrain can inhibit wildfires: fire travels downslope much more slowly than it does upslope, and ridgetops often mark the end of a wildfire's rapid spread (FEMA 1997).

Fuel – Fuels are classified by weight or volume (fuel loading) and by type. Fuel loading is used to describe the amount of vegetative material available. If this amount doubles, energy released can also double. Each fuel type is given a burn index—an estimate of amount of potential energy that may be released, effort required to ignite a fire in a given fuel and expected flame length. Different fuels have different burn qualities, and some burn more easily than others. Grass fires release relatively little energy but can sustain very high rates of spread (FEMA 1997). According to the U.S. Forest Service (USFS), a forest stand may consist of several layers of live and dead vegetation in the understory (surface fuels), midstory (ladder fuels), and overstory (crown fuels):

- Surface fuels consist of grasses, shrubs, litter, and woody material lying on the ground. Surface fires burn low vegetation, woody debris, and litter. Under the right conditions, surface fires reduce likelihood that future wildfires will grow into crown fires.
- Ladder fuels consist of live and dead small trees and shrubs; live and dead lower branches from larger trees, needles, vines, lichens, mosses; and any other combustible biomass between the top of surface fuels and bottom of overstory tree crowns.
- Crown fuels are suspended above the ground in treetops or other vegetation and consist mostly of live and dead fine material. When historically low-density forests become overcrowded, tree crowns may merge and form a closed canopy. Tree canopies constitute the primary fuel layer in a forest crown fire (USFS 2003).

Weather / Air Mass – Weather is the most important factor influencing fire behavior, but it is always changing. Air mass, defined by the National Weather Service (NWS) as a body of air covering a relatively wide area and exhibiting horizontally uniform properties, can affect wildfire through climatic factors that include temperature and relative humidity, local wind speed and direction, cloud cover, precipitation amount and duration, and stability of the atmosphere at the time of the fire (NWS 2009). Extreme weather leads to extreme events, and often a subsidence of severe weather marks the end of a wildfire's growth and the beginning of successful containment. High temperatures and low humidity can produce vigorous fire activity. Fronts and thunderstorms





can produce winds that radically and suddenly change in speed and direction, causing similar changes in fire activity. The rate of spread of a fire varies directly with wind velocity. Winds may play a dominant role in directing the course of a fire. The most damaging firestorms are typically marked by high winds (FEMA 1997).

Several tools are available to estimate fire potential, extent, danger, and growth, including, but not limited to, the following:

- The Wildland Fire Assessment System (WFAS) is an internet-based information system that provides a national view of weather and fire potential, including national fires danger, weather maps, and satellite-derived "greenness" maps (USFS n.d.).
- The Fire Potential Index (FPI) is derived by combining information on daily weather and vegetation condition and can identify areas most susceptible to fire ignition (Burgan, Klaver and Klaver 2000).
- Fuel Moisture (FM) content is quantity of water in a fuel particle expressed as a percent of oven-dry weight of the fuel particle and is an expression of cumulative effects of past and present weather events, to help evaluate the effects of current or future weather on fire potential (Burgan, Klaver and Klaver 2000).
- The Keetch-Byram Drought Index (KBDI) is designed for fire potential assessment and is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers (USFS n.d.).
- The Haines Index, also known as the Lower Atmosphere Stability Index, is a fire weather index based on stability and moisture content of the lower atmosphere that measures potential for existing fires to become large fires (USFS n.d.).
- The Buildup Index (BUI) is a number that reflects combined cumulative effects of daily drying and precipitation in fuels with a 10-day time lag constant (North Carolina Forest Service 2009).

The Fire Danger Rating in New York is established using information from the National Fire Danger Rating System (NFDRS) and takes into account current and antecedent weather, fuel types, and both live and dead fuel moisture. This information is provided by local station managers (USFS n.d.) in each of the ten regions of New York State. Figure 5.4.11-3 shows an example of a Fire Danger Rating Areas (FDRA) in NYS and the fire danger risk within each area on a specific date. Monroe County is part of the Lake Ontario Plains FDRA. On this particular day, the Lake Ontario Plains Fire Danger Rating was low, however some parts of the state were experiencing moderate fire danger. Table 5.4.11-1 lists fire danger ratings and color codes, also used by NYSDEC to update its fire danger rating maps, identified earlier in Figure 5.4.11-3.

Adjective Rating Class and Color Code	Class Description
Red Flag	A short-term, temporary warning, indicating the presence of a dangerous combination of temperature, wind, relative humidity, fuel or drought conditions that can contribute to new fires or rapid spread of existing fires. A Red Flag Warning can be issued at any Fire Danger level.
Extreme (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.
Very High (orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.

Table 5.4.11-1. Description of Fire Danger Ratings in New York State



Adjective Rating Class and	
Color Code	Class Description
High (yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly, and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Moderate (blue)	Fires can start from most accidental causes but, with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
Low (green)	Fuels do not ignite readily from small firebrands, although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
Courses NVC DUCEC 2022	

Source: NYS DHSES 2022

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with wildfires throughout New York State and Monroe County; therefore, the loss and impact information for many events varies depending on the source. The accuracy of monetary figures discussed is based on the available information in cited sources.

Short-term effects of wildfires can include destruction of timber, forest, wildlife habitats, scenic vistas, and watersheds. Business and transportation can also be disrupted in the short term. Long-term effects can include reduced access to recreational areas and destruction of community infrastructure and cultural and economic resources (USDA n.d.).

According to Ranger Division wildfire occurrence data from 1993 through 2017, 95 percent of wildfires in the state were human-caused; the remaining 5 percent are the result of lightning. With regards to human-caused fires, debris burning accounted for 33 percent; arson accounted for 16 percent; campfires accounted for 16 percent; children accounted for 4 percent; and smoking, equipment, and railroads accounted for 25 percent (NYSDEC 2022). Figure 5.4.11-5 illustrates occurrences of natural vegetation wildfires in New York State between 2003 and 2017. This figure reveals occurrences of between 0 and 18.5 wildfires per square mile within Monroe County municipalities with the highest number focused on the center and eastern two thirds of the County.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State was included in two FEMA declared wildfire specific disasters (DR) or emergency declarations (EM). Monroe County was not included in either of these declarations (FEMA 2022).

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that noted wildfire was a contributing factor:

- S4023 2016 Drought
- S4031 2016 Drought
- S4052 2016 Drought (USDA 2022)



The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are low the following years as well. USDA records indicate that Monroe County did not have crop losses specifically attributed to wildfire.

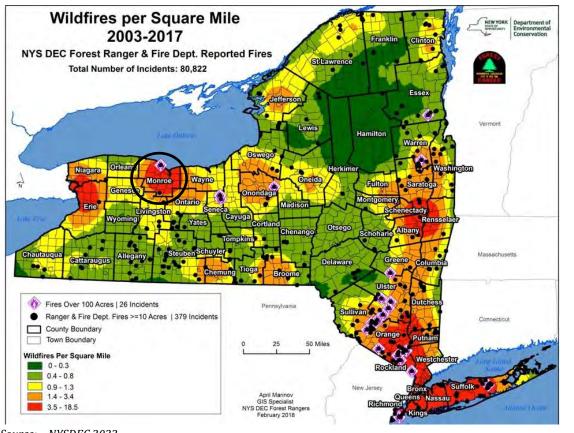


Figure 5.4.11-5. Wildfire Occurrences in New York State, 2003-2017

Source:NYSDEC 2022Note:The black oval indicates the location of Monroe County.

Previous Events

Table 5.4.11-2 identifies the known wildfire events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).





Table 5.4.11-2. Wildfire Events between 2015 and 2022

Date(s) of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
May 26, 2015	Wildfire	N/A	No	A wildfire detected in the Town of Hamlin

Sources: NASA FIRMS 2015; Monroe County Fire Wire 2015

Note: Monetary figures within this table were U.S. Dollar (USD) figures calculated during or after the approximate time of the event. If such an event would occur in the present day, monetary losses would be considerably higher in USDs as a result of inflation.

 FEMA
 Federal Emergency Management Agency
 N/A
 Not applicable





Climate Change Impacts

Fire potential depends on climate variability, local topography, and human intervention. Climate change can affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot, dry spells create the highest fire risk. With temperatures increasing in New York State, wildfire danger may intensify with warming and drying of vegetation. When climate alters fuel loads and fuel moisture, the susceptibility of the forest to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Temperatures in New York State are warming, with an average rate of warming over the past century of $0.25 \,^{\circ}$ F per decade. Average annual temperatures are projected to increase across New York State by 2 °F to 3.4 °F by the 2020s, 4.1 °F to 6.8 °F by the 2050s, and 5.3 °F to 10.1 °F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA 2014). The total number of hot days in New York State is expected to increase as this century progresses. The frequency and duration of heat waves, defined as three or more consecutive days with maximum temperatures at or above 90 °F, are also expected to increase. In contrast, extreme cold events, defined both as the number of days per year with minimum temperature at or below 32 °F and those at or below 0 °F, are expected to decrease as average temperatures rise (NYSERDA 2011).

Each region within NYS, as defined by the Integrated Assessment for Effective Climate Change in New York State (ClimAID), contains attributes that climate change will affect. Monroe County is part of ClimAID Region 1: The Great Lake Plains. In ClimAID Region 1, temperatures are estimated to increase between 3.7 to 7.3 °F by the 2050s and 4.2 to 12 °F by the 2080s (baseline of 47.7 °F) (NYSERDA 2014). Extreme heat events and heat waves are also projected to increase, as listed in Table 5.4.11-3 below. Prolonged heat waves are likely to generate a greater number of wildfires. Stronger winds from larger storms may lead to more fallen branches for wildfires to consume. Increases in rain and snow events prime forests for fire by supporting growth of more fuel. Drought and warmer temperatures lead to drier forest fuels (NYS DHSES 2014).

In Region 1, it is estimated that temperatures will increase by 4.3°F to 6.3°F by the 2050s and 5.7°F to 9.6°F by the 2080s (baseline of 47.7°F) (NYSERDA 2014). Extreme events are also projected to increase, as illustrated in Table 5.4.11-3 below.

Event Type (2020s)	Low Estimate (10 th Percentile)	Middle Range (25th to 75 th Percentile)	High Estimate (90ª Percentile)
Days over 90 °F (8 days)	12	14-17	19
# of Heat Waves (0.7 heat waves)	2	2	2
Duration of Heat Waves (4 days)	4	4	4
Days below 32 °F (133 days)	99	103 to 111	116

Table 5.4.11-3. Extreme Event Projections for Region 1

Source: NYSERDA 2014

A gradual change in temperatures will alter the growing environment of many tree species throughout the United States and New York, reducing the growth of some trees and increasing the growth of others. Tree growth and regeneration may be affected more by extreme weather events and climatic conditions than by gradual changes in temperature or precipitation. Warmer temperatures may lead to longer dry seasons and multi-year droughts, creating triggers for wildfires, insects, and invasive species. Increased temperature and change in precipitation





will also affect fuel moisture during wildfire season and the length of time wildfires can burn in a given year (USDA 2011).

Climate change may also increase the frequency of lightning strikes. A warmer atmosphere holds more moisture, which is one of the key items for triggering a lightning strike. Lightning strikes cause approximately half of the wildfires in the United States. If the frequency of lightning strikes increases, the potential for wildfires from these strikes also increases (Lee 2014). Wildfire incidents are predicted to increase throughout the United States because of climate change, causing at least a doubling of areas burned within the next century (USDA 2011).

Climate change directly and indirectly affects growth and productivity of forests: directly as a result of changes in atmospheric carbon dioxide and climate, and indirectly through complex interactions within forest ecosystems. Climate also affects the frequency and severity of many forest disturbances, such as infestations, invasive species, wildfires, and storm events. As temperatures increase, the suitability of a habitat for specific types of trees changes. There is also evidence that prolonged heat waves are likely to lead to a greater number of wildfires. Stronger winds from larger storms may lead to more fallen branches for wildfires to consume. An increase in rain and snow events primes forests for fire by supporting growth of more fuel. Drought and warmer temperatures lead to drier forest fuels (NYS DHSES 2014).

Probability of Future Occurrences

According to the New York State Forest Ranger Division, wildfire occurrence data from 1993 to 2017 have shown that New York State, including Monroe County, is susceptible to wildfires. Beginning in 2010, New York State enacted revised open burning regulations that ban brush burning statewide during this time period. Forest ranger data indicate that this new statewide ban resulted in 74 percent fewer wildfires caused by debris burning in upstate New York from 2010 to 2012. Forest ranger and fire department historical fire occurrence data recorded after the new burn ban regulations were enacted in 2010 will serve as a benchmark for analysis of wildfire occurrence (NYS DHSES 2014).

Fire probability depends on local weather conditions, outdoor activities (such as camping, debris burning, and construction) and the degree of public cooperation with fire prevention measures. Dry weather, such as drought, can increase the likelihood of wildfire events. Lightning can also trigger wildfire and urban fire events. Other natural disasters can increase the probability of wildfires by producing fuel in both urban and rural areas. Forest damage from hurricanes and tornadoes may block interior access roads and fire breaks, pull down overhead power lines, or damage pavement and underground utilities (NVRC 2006).

Wildfire experts point to four reasons why wildfire risks are increasing:

- Fuel, in the form of fallen leaves, branches, and plant growth, has accumulated over time on the forest floor. Now, this fuel has the potential to "feed" a wildfire.
- Increasingly hot, dry weather has occurred and will occur within the United States.
- Weather patterns across the country are changing.
- More homes are built within areas of WUI, meaning that homes are built closer to wildland areas where wildfires can occur (NYS DHSES 2011).

Annual small wildfires likely will occur throughout New York State (as the state has regularly undergone in the past). However, advanced methods of wildfire management and control and a better understanding of the fire ecosystems should reduce the number of devastating fires in the future (NYS DHSES 2011).

The hazards of concern identified for Monroe County were ranked in Section 5.3. Probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from





the Planning Committee, the probability of occurrence of wildfire within the County is considered "occasional" (between 10 and 100 percent annual probability of a hazard event occurring).

5.4.11.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable within the hazard area identified. The following discusses Monroe County's vulnerability to the wildfire hazard.

Impact on Life, Health and Safety

Wildfires have the potential to impact human health and life of residents and responders, structures, infrastructure, and natural resources. Given the immediate response times to reported wildfires, the likelihood of injuries and casualties is minimal. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. The most vulnerable populations include emergency responders and those within a short distance of the interface between the built environment and the wildland environment. Table 5.4.11-4 summarizes the estimated population exposed to the wildfire hazard by jurisdiction.

Based on the analysis, an estimated 43,218 residents (5.7 percent of the County population) are located in the WUI interface hazard area and 59,539 residents (7.9 percent of the County's population) are located in the WUI intermix hazard areas. Overall, the Town of Greece has the greatest number of individuals located in the wildfire hazard areas (i.e., 19,164 persons in the WUI interface and 4,981 in the WUI intermix).

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over age 65. Monroe County contains approximately 127,588 people over the age of 65 and 100,484 people below the poverty level (US Census 2020). Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impacts on their families. The population over age 65 is also more vulnerable because they are more likely to seek or need medical attention that may not be available due to isolation during a wildfire event, and they may have more difficulty evacuating. Smoke and air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, and nitrogen oxides), and toxics (formaldehyde and benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency (or temperature) of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

		Estimated Population Located Within the Wildland-Urban Interface/Interr (WUI) Wildfire Hazard Areas					
Jurisdiction	Total Population (2020 Decennial Census)	Number of People in the WUI Interface Wildfire Hazard Area	Percent of Total	Number of People in the WUI Intermix Wildfire Hazard Area	Percent of Total		
Brighton (T)	37,137	0	0.0%	4,397	11.8%		
Brockport (V)	7,104	4,174	58.8%	106	1.5%		
Chili (T)	29,123	4,680	16.1%	2,615	9.0%		
Churchville (V)	2,091	0	0.0%	0	0.0%		
Clarkson (T)	6,904	3,147	45.6%	2,384	34.5%		

Table 5.4.11-4. Estimated Population within the WUI in Monroe County





		hin the Wildland-Urban Interface/Intermix Idfire Hazard Areas			
Jurisdiction	Total Population (2020 Decennial Census)	Number of People in the WUI Interface Wildfire Hazard Area	Percent of Total	Number of People in the WUI Intermix Wildfire Hazard Area	Percent of Total
East Rochester (T/V)	6,334	0	0.0%	91	1.4%
Fairport (V)	5,501	0	0.0%	0	0.0%
Gates (T)	29,167	4,151	14.2%	1,868	6.4%
Greece (T)	96,926	19,164	19.8%	4,981	5.1%
Hamlin (T)	8,725	606	6.9%	1,021	11.7%
Henrietta (T)	47,096	0	0.0%	2,360	5.0%
Hilton (V)	6,027	0	0.0%	54	0.9%
Honeoye Falls (V)	2,706	0	0.0%	496	18.3%
Irondequoit (T)	51,043	0	0.0%	7,114	13.9%
Mendon (T)	6,389	0	0.0%	667	10.4%
Ogden (T)	16,585	2,302	13.9%	1,894	11.4%
Parma (T)	10,190	2,083	20.4%	3,095	30.4%
Penfield (T)	39,438	0	0.0%	4,679	11.9%
Perinton (T)	39,128	0	0.0%	4,831	12.3%
Pittsford (T)	25,714	0	0.0%	1,923	7.5%
Pittsford (V)	1,419	0	0.0%	181	12.7%
Riga (T)	3,495	799	22.9%	353	10.1%
Rochester (C)	211,328	0	0.0%	589	0.3%
Rush (T)	3,490	0	0.0%	561	16.1%
Scottsville (V)	2,009	0	0.0%	55	2.8%
Spencerport (V)	3,685	0	0.0%	531	14.4%
Sweden (T)	6,140	235	3.8%	611	10.0%
Webster (T)	39,676	1,877	4.7%	11,357	28.6%
Webster (V)	5,651	0	0.0%	399	7.1%
Wheatland (T)	2,888	0	0.0%	326	11.3%
Monroe County (Total)	753,109	43,218	5.7%	59,539	7.9%

Sources: U.S. Census 2020; University of Wisconsin 2010 Notes: (C) = City, (T) = Town, (V) = Village

Impact on General Building Stock

The most vulnerable structures to wildfire events are those located within the WUI areas. If a wildfire occurs at a WUI, it can also cause an urban fire and in this case has the potential for great damage to infrastructure, because of the high density of population and structures in these areas. Buildings constructed of wood or vinyl siding are generally more likely to be damaged by the fire hazard than buildings constructed of brick or concrete. The hazard areas were overlaid on the building inventory in the County (Census block) to estimate the buildings exposed to the wildfire hazard. The replacement cost value of the structures with their center in the hazard area were totaled. Table 5.4.11-5 summarizes the number of buildings exposed by municipality. The limitations of this analysis are recognized, and as such the analysis is only used to provide a general estimate. Approximately 5.5 percent of the County's buildings are located in the WUI interface hazard area, and approximately 0.1 percent of the County's buildings are located in the WUI intermix hazard area.





Table 5.4.11-5. Building Stock within the WUI in Monroe County

Jurisdiction	Total Number of Buildings	Estimated Number of Buildings in the WUI Interface Wildfire Hazard Area	Number of Structure Percent of Total	es Located in the Wildfi Number of Buildings in the WUI Intermix Wildfire Hazard Area	re Hazard Areas Percent of Total
Brighton (T)	11,693	0	0.0%	1,442	12.3%
Brockport (V)	2,224	1,270	57.1%	32	1.4%
Chili (T)	11,534	1,918	16.6%	1,047	9.1%
Churchville (V)	1,112	0	0.0%	0	0.0%
Clarkson (T)	3,411	1,405	41.2%	1,271	37.3%
East Rochester (T/V)	2,924	0	0.0%	35	1.2%
Fairport (V)	2,394	0	0.0%	0	0.0%
Gates (T)	11,801	1,564	13.3%	796	6.7%
Greece (T)	36,414	6,984	19.2%	1,953	5.4%
Hamlin (T)	5,539	336	6.1%	683	12.3%
Henrietta (T)	15,982	0	0.0%	765	4.8%
Hilton (V)	2,143	0	0.0%	17	0.8%
Honeoye Falls (V)	1,155	0	0.0%	218	18.9%
Irondequoit (T)	21,885	0	0.0%	2,928	13.4%
Mendon (T)	3,835	0	0.0%	374	9.8%
Ogden (T)	7,407	961	13.0%	880	11.9%
Parma (T)	5,509	1,193	21.7%	1,663	30.2%
Penfield (T)	15,882	0	0.0%	1,885	11.9%
Perinton (T)	16,817	0	0.0%	2,159	12.8%
Pittsford (T)	10,590	0	0.0%	789	7.5%
Pittsford (V)	804	0	0.0%	111	13.8%
Riga (T)	2,356	440	18.7%	203	8.6%
Rochester (C)	89,392	0	0.0%	229	0.3%
Rush (T)	2,808	0	0.0%	447	15.9%
Scottsville (V)	1,069	0	0.0%	28	0.0%
Spencerport (V)	1,654	0	0.0%	212	0.1%
Sweden (T)	3,465	131	3.8%	420	0.1%
Webster (T)	16,660	1,050	6.3%	4,688	0.3%
Webster (V)	1,633	0	0.0%	98	0.1%
Wheatland (T)	1,926	0	0.0%	178	0.1%
Monroe County (Total)	312,018	17,252	5.5%	25,551	0.1%

Sources: Monroe County GIS 2022; University of Wisconsin 2010 Notes: (C) = City, (T) = Town, (V) = Village

Impact on Critical Facilities

A number of critical facilities are within the wildfire hazard area, and are also vulnerable to the threat of wildfire. Many of these facilities are locations of vulnerable populations (schools and senior facilities) and agencies that respond to wildfire events (fire and police). Table 5.4.11-6 summarizes the number of critical facilities and lifelines within the WUI Intermix and Interface hazard areas by jurisdiction. Overall, 124 critical facilities (120 of which are considered lifelines) are located in the wildland-urban intermix hazard area and 82 critical facilities (72 of which are considered lifelines) are located in the wildland-urban interface hazard area. The Town of Greece has the greatest number of critical facilities built in the wildland-urban interface (i.e., 21 critical facilities) and the Town of Chili and Town of Greece have the greatest number of critical facilities built in the wildland-urban intermix hazard areas (i.e., 14 critical facilities each). Critical facilities are further broken out by type





within the WUI Interface and Intermix hazard areas, as summarized in Table 5.4.11-6. Lifeline types located in the wildfire hazard areas are identified in Table 5.4.11-7.





Table 5.4.11-6. Facilities within the WUI (Intermix or Interface) in Monroe County

	Total		Number of Critical Facilities and Lifeline Facilities Located in the Wildland-Urban Intermix Wildfire Hazard Area			Number of Critical Facilities and Lifeline Facilities Located in the Wildland-Urban Intermix Wildfire Hazard Area				
Jurisdiction	Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines	Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Brighton (T)	69	65	5	7.2%	5	7.7%	5	7.2%	5	7.7%
Brockport (V)	29	28	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chili (T)	111	102	14	12.6%	14	13.7%	14	12.6%	14	13.7%
Churchville (V)	24	23	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Clarkson (T)	14	10	2	14.3%	2	20.0%	2	14.3%	2	20.0%
East Rochester (T/V)	31	29	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Fairport (V)	17	16	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Gates (T)	58	54	4	6.9%	4	7.4%	4	6.9%	4	7.4%
Greece (T)	165	158	14	8.5%	14	8.9%	14	8.5%	14	8.9%
Hamlin (T)	23	22	8	34.8%	8	36.4%	8	34.8%	8	36.4%
Henrietta (T)	111	103	5	4.5%	5	4.9%	5	4.5%	5	4.9%
Hilton (V)	21	20	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Honeoye Falls (V)	17	16	8	47.1%	7	43.8%	8	47.1%	7	43.8%
Irondequoit (T)	103	100	3	2.9%	3	3.0%	3	2.9%	3	3.0%
Mendon (T)	21	20	4	19.0%	4	20.0%	4	19.0%	4	20.0%
Ogden (T)	42	38	6	14.3%	5	13.2%	6	14.3%	5	13.2%
Parma (T)	18	16	6	33.3%	6	37.5%	6	33.3%	6	37.5%
Penfield (T)	73	68	7	9.6%	7	10.3%	7	9.6%	7	10.3%
Perinton (T)	64	57	8	12.5%	7	12.3%	8	12.5%	7	12.3%
Pittsford (T)	45	39	4	8.9%	3	7.7%	4	8.9%	3	7.7%
Pittsford (V)	14	13	4	28.6%	4	30.8%	4	28.6%	4	30.8%
Riga (T)	20	18	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Rochester (C)	639	605	1	0.2%	1	0.2%	1	0.2%	1	0.2%
Rush (T)	29	26	6	20.7%	6	23.1%	6	20.7%	6	23.1%
Scottsville (V)	14	13	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Spencerport (V)	13	13	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sweden (T)	11	11	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Webster (T)	55	53	13	23.6%	13	24.5%	13	23.6%	13	24.5%
Webster (V)	16	15	1	6.3%	1	6.7%	1	6.3%	1	6.7%
Wheatland (T)	23	21	1	4.3%	1	4.8%	1	4.3%	1	4.8%
Monroe County (Total)	1,890	1,773	124	6.6%	120	6.8%	124	6.6%	120	6.8%

Source: Monroe County 2022; University of Wisconsin 2010

Notes: (C) = City, (T) = Town, (V) = Village





Table 5.4.11-7. Lifeline Facilities within the WUI (Intermix or Interface) in Monroe County

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Located in the Wildland-Urban Interface Wildfire Hazard Area	Number of Lifelines Located in the Wildland-Urban Intermix Wildfire Hazard Area
Communications	68	5	8
Energy	14	0	0
Food, Water, Shelter	286	18	25
Hazardous Material	1	0	0
Health and Medical	93	1	10
Safety and Security	1,274	47	77
Transportation	36	1	0
Monroe County (Total)	1,772	72	120

Source: Monroe County 2022; University of Wisconsin 2010





Impact on Economy

Wildfire events can have major economic impacts on a community from the initial loss of structures and the subsequent loss of revenue from destroyed businesses and decreases in tourism. Wildfires can cost thousands of taxpayer dollars to suppress and control and can involve hundreds of operating hours on fire apparatus and thousands of volunteer man hours from the volunteer firefighters. There are also many direct and indirect costs to local businesses that provide employees with time off to volunteer to fight these fires.

Table 5.4.11-8 summarizes the estimated building stock inventory exposed by municipality. The limitations of this analysis are recognized, and as such the analysis is only used to provide a general estimate. Approximately 3.9 percent (\$12.2 billion) of the County's replacement cost value is located in the WUI interface hazard area, and approximately 5.2 percent (\$16.4 billion) of the County's replacement cost value is located in the WUI interface hazard area, intermix hazard area.

		Estimated Total Replacement Cost Value of Structures Located in the Wildfire Hazard Areas				
Jurisdiction	Total Replacement Cost Value (RCV)	Total RCV of Buildings Located in the WUI Interface Wildfire Hazard Area	Percent of Total	Total RCV of Buildings Located in the WUI Intermix Wildfire Hazard Area	Percent of Total	
Brighton (T)	\$14,443,886,002	\$0	0.0%	\$1,186,836,024	8.2%	
Brockport (V)	\$5,158,789,593	\$2,472,603,273	47.9%	\$9,532,926	0.2%	
Chili (T)	\$9,206,843,885	\$1,305,889,268	14.2%	\$622,171,237	6.8%	
Churchville (V)	\$938,164,078	\$0	0.0%	\$0	0.0%	
Clarkson (T)	\$1,887,392,030	\$668,022,331	35.4%	\$828,501,014	43.9%	
East Rochester (T/V)	\$3,440,171,127	\$0	0.0%	\$13,844,475	0.4%	
Fairport (V)	\$2,281,456,075	\$0	0.0%	\$0	0.0%	
Gates (T)	\$12,220,599,285	\$545,862,128	4.5%	\$821,130,034	6.7%	
Greece (T)	\$26,954,378,684	\$4,164,052,659	15.4%	\$1,468,468,649	5.4%	
Hamlin (T)	\$2,318,778,027	\$116,872,394	5.0%	\$342,147,263	14.8%	
Henrietta (T)	\$23,460,566,322	\$0	0.0%	\$578,353,234	2.5%	
Hilton (V)	\$2,120,287,988	\$0	0.0%	\$5,656,507	0.3%	
Honeoye Falls (V)	\$1,813,180,690	\$0	0.0%	\$219,371,913	12.1%	
Irondequoit (T)	\$13,427,006,840	\$0	0.0%	\$1,169,893,590	8.7%	
Mendon (T)	\$2,852,155,915	\$0	0.0%	\$221,664,720	7.8%	
Ogden (T)	\$5,558,087,440	\$648,996,610	11.7%	\$655,119,709	11.8%	
Parma (T)	\$3,373,412,574	\$940,465,375	27.9%	\$991,289,442	29.4%	
Penfield (T)	\$11,119,233,991	\$0	0.0%	\$1,263,191,307	11.4%	
Perinton (T)	\$13,125,415,407	\$0	0.0%	\$1,461,139,537	11.1%	
Pittsford (T)	\$10,686,774,000	\$0	0.0%	\$477,211,403	4.5%	
Pittsford (V)	\$1,776,834,511	\$0	0.0%	\$195,408,082	11.0%	
Riga (T)	\$1,539,492,845	\$186,597,276	12.1%	\$178,658,659	11.6%	
Rochester (C)	\$119,943,371,056	\$0	0.0%	\$78,776,290	0.1%	
Rush (T)	\$1,816,445,354	\$0	0.0%	\$214,448,885	11.8%	
Scottsville (V)	\$908,716,753	\$0	0.0%	\$75,724,774	8.3%	
Spencerport (V)	\$1,580,844,696	\$0	0.0%	\$118,792,132	7.5%	
Sweden (T)	\$3,402,258,236	\$73,724,593	2.2%	\$226,661,211	6.7%	
Webster (T)	\$11,510,191,170	\$1,081,442,876	9.4%	\$2,706,113,413	23.5%	
Webster (V)	\$3,634,066,282	\$0	0.0%	\$76,383,368	2.1%	
Wheatland (T)	\$2,509,077,040	\$0	0.0%	\$234,376,260	9.3%	

Table 5.4.11-8. Building Stock Replacement Cost Value within the WUI in Monroe County





		Estimated Total Replacement Cost Value of Structures Located in the Wildfire Hazard Areas				
	Total Replacement	Total RCV of Buildings Located in the WUI Interface Wildfire	Percent	Total RCV of Buildings Located in the WUI Intermix Wildfire	Percent	
Jurisdiction	Cost Value (RCV)	Hazard Area	of Total	Hazard Area	of Total	
Monroe County (Total)	\$315,007,877,896	\$12,204,528,782	3.9%	\$16,440,866,055	5.2%	

Sources: Monroe County GIS 2022; University of Wisconsin 2010 Notes: (C) = City, (T) = Town, (V) = Village

Impact on the Environment

Wildfire can lead to ancillary impacts such as landslides in steep ravine areas and flooding caused by the impacts of silt in local watersheds. According to the USGS, post-fire runoff polluted with debris and contaminants can be extremely harmful to ecosystem and aquatic life. Studies show that urban fires in particular are more harmful to the environment compared to forest fires (USGS 2018). The age and density of infrastructure within Monroe County can exacerbate consequences of fires on the environment because of the increased amount of chemicals and contaminants that would be released from burning infrastructure. These chemicals, such as iron lead, and zinc, may leach into the storm water, contaminate nearby streams, and impair aquatic life.

Cascading Impacts On Other Hazards

Wildfires result in the uncontrolled destruction of forests, brush, field crops, grasslands, real estate, and personal property, and have secondary impacts on other hazards such as flooding, by removing vegetation and destroying watersheds. Additionally, wildfires can increase because of rising temperatures and increased droughts. More information about extreme temperature and drought hazards of concern is provided in Section 5.4.4 and Section 5.4.2, respectively.

Severe wildfires can result in a loss of vegetation that causes slope instability. This can contribute to an increase in landslide events. For more information on landslides, refer to Section 5.4.8. Vegetation loss can also increase the amount of runoff during rainfall events, increasingly the likelihood for flash flooding. For more information on the flood hazard, refer to Section 5.4.5.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Areas targeted for potential future growth and development within the next 5 years have been identified across Monroe County at the jurisdiction level. Refer to the jurisdictional annexes in Volume II of this HMP. Any new development and new residents within the WUI are expected to be exposed to the wildfire hazard. Refer to the jurisdictional annexes in Volume II of this HMP for maps which include new development project areas and their proximity to the wildland-urban interface/intermix hazard areas.





Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County's population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of population, particularly in the WUI, can impact the number of persons exposed to the wildfire hazard. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

According to the USDA Forest Service, climate change will likely alter the atmospheric patterns that affect fire weather. Changes in fire patterns will, in turn, impact carbon cycling, forest structure, and species composition (US EPA 2020). Climate change associated with warmer temperatures, changes in rainfall, and increased periods of drought may create an atmospheric and fuel environment that is more conductive to large, severe fires. Under a changing climate, wildfires exceeding 50,000 acres have increased over the past 30 years (USDA 2012a). Understanding the climate/fire/vegetation interactions is essential for addressing issues associated with climate change that include:

- Effects on regional circulation and other atmospheric patterns that affect fire weather
- Effects of changing fire regimes on the carbon cycle, forest structure, and species composition, and
- Complications from land use change, invasive species, and an increasing WUI.

As discussed earlier, average temperatures are anticipated to increase in New York; therefore, the suitability of habitats for specific types of trees will potentially change, altering the fire regime and resulting in more frequent fire events and changes in intensity. Prolonged and more frequent heat waves have the potential to increase the likelihood of a wildfire. The increased potential combined with stronger winds may make it harder to contain fires and thus will increase the County's vulnerability to this hazard.

Change of Vulnerability Since 2017 HMP

Monroe County continues to be vulnerable to the wildfire hazard. However, there are several differences between the exposure estimates of this plan update and the results reported in the 2017 HMP. Population statistics have been updated using the 2020 US Census. The building stock inventory was updated using data from Monroe County. Additionally, the critical facility inventory list was updated by Monroe County.





SECTION 6. MITIGATION STRATEGIES

This section presents mitigation strategies for Monroe County to reduce potential exposure and losses identified as concerns in the Risk Assessment portion of this plan. The Steering Committee reviewed the Risk Assessment to identify and develop these mitigation actions, which are presented herein.

This section includes:

- 1. Background and Past Mitigation Accomplishments
- 2. General Planning Approach
- 3. Review and Update of Mitigation Goals and Objectives
- 4. Capability Assessment
- 5. Mitigation Strategy Development

Hazard mitigation reduces the potential impacts of, and costs associated with, emergency and disaster-related events. Mitigation actions address a range of impacts, including impacts on the population, property, the economy, and the environment.

Mitigation actions can include activities such as revisions to land-use planning, training and education, and structural and nonstructural safety measures.

6.1 BACKGROUND AND PAST MITIGATION ACCOMPLISHMENTS

In accordance with the requirements of the Disaster Mitigation Act of 2000 (refer to Section 1 [Introduction] for more detail on DMA 2000), a discussion regarding past mitigation activities and an overview of past efforts are provided as a foundation for understanding the mitigation goals, objectives, and activities outlined in this plan update. The County, through previous and ongoing hazard mitigation activities, has demonstrated that it is proactive in protecting its physical assets and citizens against losses from natural hazards. Examples of previous and ongoing actions and projects include the following:

- The County facilitated the development of the original Monroe County Multi-Jurisdictional Hazard Mitigation Plan. The current planning process represents the regulatory five-year plan update process, which includes the participation of 30 jurisdictions in the County, along with key County and regional stakeholders.
- All municipalities participating in this HMP update participate in the National Flood Insurance Program (NFIP), which requires the adoption of FEMA floodplain mapping and certain minimum standards for building within the floodplain.
- Reports, plans, and studies relating to or including information on natural hazards or natural hazard policies affecting Monroe County have been reviewed and incorporated into this plan update as appropriate, as discussed in Section 3 (Planning Process) and References.

6.2 GENERAL MITIGATION PLANNING APPROACH

The overall approach used to update the County and local hazard mitigation strategies is based on FEMA and New York State (NYS) regulations and guidance regarding local mitigation plan development, including:

- DMA 2000 regulations, specifically 44 CFR 201.6 (local mitigation planning).
- FEMA Local Mitigation Planning Handbook, March 2013.
- FEMA Local Mitigation Plan Review Guide, October 1, 2011.
- FEMA Integrating Hazard Mitigation into Local Planning, March 1, 2013.
- FEMA Plan Integration: Linking Local Planning Efforts, July 2015.
- FEMA Mitigation Planning How-To Guide #3, Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3), April 2003.
- FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards, January 2013.



- NYS DHSES New York State Hazard Mitigation Planning Standards, 2017.
- NYS DHSES New York State Hazard Mitigation Planning Standards Guide, 2017.

The mitigation strategy update approach includes the following steps that are further detailed in later subsections of this section:

- Section 6.3 Review and update mitigation goals and objectives.
- Section 6.4 Identify mitigation capabilities and evaluate their capacity and effectiveness to mitigate and manage hazard risk.
- Section 6.5 Prepare an implementation strategy, including:
 - o Identification of progress on previous County and local mitigation strategies;
 - o Development of updated County and local mitigation strategies; and
 - Prioritization projects and initiatives in the updated mitigation strategy.

6.3 REVIEW AND UPDATE OF MITIGATION GOALS AND OBJECTIVES

This section documents the efforts to develop hazard mitigation goals and objectives established to reduce or avoid long-term vulnerabilities to the identified hazards.

6.3.1 Goals and Objectives

FEMA defines **Goals** as general guidelines that explain what should be achieved. Goals are usually broad, long-term, policy statements, and represent a global vision.

FEMA defines *Objectives* as strategies or implementation steps to attain mitigation goals. Unlike goals, objectives are specific and measurable, where feasible.

FEMA defines *Mitigation Actions* as specific actions that help to achieve the mitigation goals and objectives.

According to CFR 201.6(c)(3)(i): "The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards." The mitigation goals were developed based on the risk assessment results, discussions, research, and input from the committee, existing authorities, policies, programs, resources, stakeholders, and the public. The Steering Committee reviewed the 2015 goals and objectives and made revisions for the 2022 update based on the risk assessment results, discussions, research, and input from among the committee, existing authorities, policies, programs, resources, stakeholders, and the public. For the purposes of this plan, goals and objectives are defined as follows:

Goals are general guidelines that explain what is to be achieved. They are usually broad, long-term, policy-type statements and represent global visions. Goals help define the benefits that the plan is trying to achieve. The success of the plan, once implemented, should be

measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).

Objectives are short-term aims that form a strategy or course of action to meet a goal. Unlike goals, objectives are stand-alone measurements of the effectiveness of a mitigation action. The objectives also are used to help establish priorities.

During the 2022 plan update process, the Steering Committee reviewed the goals and objectives established in the 2015 HMP. These goals and objectives were reviewed in consideration of the hazard events and losses since the 2015 plan, the updated hazard profiles and vulnerability assessment, the goals and objectives established in the New York State 2019 HMP, Monroe County, and local risk management plans as well as direct input on how the County and municipalities need to move forward to best manage their hazard risk. Amendments include additions/edits to goals and/or objectives to express the Planning Partnership's interests in integrating this plan





with other planning mechanisms/programs and to support mitigation through the protection and preservation of natural systems, including particular reference to certain goals and objectives in the NYS 2019 HMP update, as identified in the table below.

As a result of this review process, the goals and objectives for the 2022 update were updated to those presented in Table 6-1.

Goals	Objectives					
Goal 1: Coordinate	Objective 1.1: Develop and maintain multi-jurisdictional coordination efforts related to hazard mitigation and planning.					
hazard mitigation programs and other planning efforts that	Objective 1.2: Develop and maintain partnerships with external federal, state, municipal, and community stakeholders that have a role in hazard mitigation to leverage and share resources.					
affect the County.	Objective 1.3: Track and/or recommend local, County, state, and federal legislation and regulations related to hazard mitigation.					
Goal 2: Prevent hazards	Objective 2.1: Develop and maintain local regulations that reduce vulnerability to hazards.					
from negatively	Objective 2.2: Develop and maintain local plans that build resilience to hazards.					
impacting new development.	Objective 2.3: Continue to better integrate and update the stormwater management systems within the County.					
	Objective 3.1: Encourage homeowners, renters, and businesses to insure their properties against all hazards, including flood coverage under the National Flood Insurance Program (NFIP).					
	Objective 3.2: Acquire, relocate, elevate, and/or retrofit existing structures located in hazard areas.					
Goal 3: Protect life, property, and the environment from	Objective 3.3: Acquire, relocate, elevate, and/or retrofit repetitive loss properties from flood-prone areas.					
current and future	Objective 3.4: Encourage local participation in the Community Rating System (CRS) Program.					
impacts.	Objective 3.5: Maintain, and continuously look to improve, emergency response capability.					
	Objective 3.6: Identify, and provide additional resources to, vulnerable and marginalized populations that have reduced capacity to respond to hazards compared with the general population.					
Goal 4: Increase public	Objective 4.1: Improve public alert, warning, and communications systems by promoting redundant and multi-faceted communications methods.					
awareness of current and future hazards, their impacts, and ways to	Objective 4.2: Conduct a coordinated public information program related to hazards and their impacts throughout the County.					
Goal 5: Protect, preserve, and restore the functions of natural systems.	Objective 4.3: Encourage property owners to implement hazard mitigation and preparedness measures on their properties.					
	Objective 4.4: Promote personal, family, and social group preparedness.					
	Objective 5.1: Encourage the use of green and natural infrastructure					
	Objective 5.2: Coordinate with local, County, state, federal, international, and other stakeholder agencies to maintain natural systems, including wetlands, parks, and riverine and coastal areas.					

Table 6-1. Monroe County Hazard Mitigation Plan Goals and Objectives

6.4 CAPABILITY ASSESSMENT

According to FEMA's *Mitigation Planning How-To Guide #3*, a capability assessment is an inventory of a community's missions, programs, and policies and an analysis of its capacity to carry them out. This assessment is an integral part of the planning process. The assessment process enables identification, review, and analysis of current local and state programs, policies, regulations, funding, and practices that could either facilitate or hinder mitigation.





During the original planning process, the County and participating jurisdictions identified and assessed their capabilities in the areas of existing programs, policies, and technical documents. By completing this assessment, each jurisdiction learned how or whether they would be able to implement certain mitigation actions by determining the following:

- Limitations that may exist on undertaking actions;
- The range of local and/or state administrative, programmatic, regulatory, financial, and technical resources available to assist in implementing their mitigation actions;
- Actions deemed infeasible as they are currently outside the scope of capabilities;
- Types of mitigation actions that may be technically, legally (regulatory), administratively, politically, or fiscally challenging or infeasible;
- Opportunities to enhance local capabilities to support long-term mitigation and risk reduction.

During the plan update process, all participating jurisdictions were tasked with developing or updating their capability assessment, paying particular attention to evaluating the effectiveness of these capabilities in supporting hazard mitigation and identifying opportunities to enhance local capabilities.

County and municipal capabilities in the Planning and Regulatory, Administrative and Technical, and Fiscal arenas may be found in the Capability Assessment section of each jurisdictional annex in Section 9 - Annexes. Within each annex, participating jurisdictions identified how they have integrated hazard risk management into their existing planning, regulatory, and operational/administrative framework ("integration capabilities") and how they intend to promote this integration ("integration actions"). A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7 – Plan Maintenance.

The Monroe County Office of Emergency Management (OEM) staff provided leadership for the Monroe County HMP Update planning effort. In addition, the County staff on the Steering Committee provided continuous support for the implementation of mitigation projects and mitigation educational outreach and serves as a resource to the county and municipalities.

A summary of the various federal, state, county, and local planning and regulatory, administrative and technical, and fiscal programs available to promote and support mitigation and risk reduction in Monroe County are presented below.

6.4.1 Planning and Regulatory Capabilities - County and Local

Municipal Land Use Planning and Regulatory Authority

The County and municipalities have various land use planning mechanisms that can be leveraged to mitigate flooding and support natural hazard risk reduction. Specific County and local planning and regulatory capabilities are identified in their jurisdictional annexes in Section 9 – Annexes. These include but are not limited to: comprehensive plans, flood damage prevention ordinances, local codes and regulations, stormwater regulations, and municipal level plans. A list of plans reviewed is provided in each annex in Section 9 (Table 9.X-2.

Section 239 of New York State General Municipal Law (GML) requires the referral of certain local planning actions to the Monroe County Planning Board for the examination of possible intermunicipal impacts. The Monroe County Planning Board operates under New York State General Municipal Law §239 l and m to advise local boards on the potential intermunicipal or countywide impact of local land use decisions. The Planning





Board uses the Monroe County Comprehensive Plan to direct recommendations on municipal land use referrals and to review proposed County capital improvement projects.

Emergency and Evacuation Plans

The Monroe County Department of Public Safety is designated to coordinate all emergency management activities in the County, including planning, response, and management. The department works collaboratively with many other agencies and organizations, which enables the County to better protect life and property during disasters and emergencies. This Department maintains the Monroe County Comprehensive Emergency Management Plan (CEMP), which is a comprehensive approach to emergency management. The CEMP is an all-hazards plan that outlines how the County will efficiently and effectively manage emergencies and disaster situations. An update to the EMP is currently underway.

The American Red Cross is the lead organization for Monroe County sheltering operations. The County has roughly 130 shelters that have been identified in the past but updating of the sheltering list and memorandums of understanding for facility use is needed.

The Monroe County Mass Shelter Plan is maintained by the Office of Emergency Management and is an annex to the CEMP (last updated in 2018). The Independently Managed Shelter Operations Plan was developed after the 2017 Windstorm and is a manual for operating an independently managed shelter. It establishes specific requirements that shelters must follow, as well as recommended best practices. The goal is to provide a temporary, safe environment for the citizens of Monroe County in the time of an emergency rendering normal habitation unsafe or impossible until the situation is resolved or other, more permanent arrangements can be safely made possible.

The Office of Public Health Preparedness is a collaborative partner in both plans and also maintains a Special Medical Needs Shelter Plan, an annex to the Monroe County Mass Sheltering Plan. The Special Medical Needs Shelter Plan guides the sheltering of medically fragile individuals.

The Monroe County annex to this HMP (Section 9.1) includes an action to work with municipalities to improve evacuation, sheltering, temporary housing and permanent housing planning.

The County's Radiological Plan for events at the Ginna Nuclear Generating Station includes a sheltering component. It also includes evacuation routes for the Towns of Penfield and Webster. The County's road network is incorporated into the County's GIS. Evacuation routes are determined at time of incident.

Local Waterfront Revitalization Program

The Waterfront Revitalization of Coastal Areas and Inland Waterways Act offers local governments the opportunity to participate in the State's Coastal Management Program (CMP) on a voluntary basis by preparing and adopting a Local Waterfront Revitalization Program (LWRP), providing more detailed implementation of the State's CMP through use of such existing broad powers as zoning and site plan review (New York State Division of Planning 2018).

When an LWRP is approved by the New York State Secretary of State, State agency actions are required to be consistent with the approved LWRP to the maximum extent practicable. When the federal government concurs with the incorporation of an LWRP into the CMP, federal agency actions must be consistent with the approved addition to the CMP. Title 19 of NYCRR Part 600, 601, 602, and 603 provide the rules and regulations that implement each of the provisions of the Waterfront Revitalization of Coastal Areas and Inland Waterways Act, including but not limited to the required content of an LWRP, the processes of review and approval of an LWRP, and LWRP amendments (New York State Division of Planning 2018).





A LWRP consists of a planning document prepared by a community and the program established to implement the plan. An LWRP may be comprehensive and address all issues that affect a community's entire waterfront, or it may address the most critical issues facing a significant portion of its waterfront. An approved LWRP reflects community consensus and provides a clear direction for appropriate future development. It establishes a long-term partnership among local government, community-based organizations, and the State. Also, funding to advance preparation, refinement, or implementation of Local Waterfront Revitalization Programs is available under Title 11 of the New York State Environmental Protection Fund Local Waterfront Revitalization Program (EPF LWRP), among other sources (New York State Division of Planning 2018).

Any village, town, or city located along the State's coast or designated inland waterway can prepare a new or amend an existing Local Waterfront Revitalization Program. Municipalities are encouraged to address local revitalization issues in a broader context, aligned with regional economic development strategies and regional resource protection and management programs (New York State Division of Planning 2018).

Comprehensive Master Plans

Comprehensive planning is a term used in the United States by land use planners to describe a process that determines community goals and aspirations in terms of community development. The outcome of comprehensive planning is the "Comprehensive Plan" or "Master Plan," which dictates public policy in terms of transportation, utilities, land use, recreation, and housing. Towns are authorized to develop and adopt a comprehensive plan by New York State Town Law Section 272-a.; villages can do the same per Section 7-722 of the Village Law. State statutes require that all land use laws in a municipality be consistent with a comprehensive plan.

6.4.2 Planning and Regulatory Capabilities – State and Federal

National Flood Insurance Program (NFIP)

The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968 (FEMA's 2002 National Flood Insurance Program (NFIP): Program Description). The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Please refer to the Flood Hazard Profile in Section 5.4.6 (Flood) for information on legislation related to reforms to the NFIP.

There are three components to the NFIP: flood insurance, floodplain management and flood hazard mapping. Communities participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Community participation in the NFIP is voluntary. Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood damage in the U.S. is reduced by nearly \$1 billion each year through communities implementing sound floodplain management requirements and property owners purchasing flood insurance. Additionally, buildings constructed in compliance with NFIP building standards suffer approximately 80% less damage annually than those not built in compliance (FEMA, 2008).

All municipalities in Monroe County actively participate in the NFIP. As of 2015, there were 1,815 NFIP policies in Monroe County. There have been 366 claims made, totaling over \$3 million for damages to structures and contents. There are 13 NFIP Repetitive Loss (RL) properties in the County. Further details on the County's flood vulnerability may be found in the flood hazard profile in Section 5.4.5 - Flood.





Municipal compliance with the NFIP is described in each of the jurisdictional annex in Section 9 (Jurisdictional Annexes). The County's municipalities have been compliant with the NFIP. To enhance their flood damage prevention programs and enhance compliance with the NFIP in the future, several municipalities propose actions in their mitigation strategies to ensure that their floodplain administrators complete training on floodplain management and the NFIP or update their flood damage prevention ordinance. All municipalities have included an action to improve Substantial Damage determination procedures. In addition, Monroe County's mitigation strategy (see Section 9.1) includes an action to encourage and empower municipalities to participate in FEMA's Community Rating System. Additional information on the NFIP program and its implementation throughout the County may be found in the flood hazard profile (Section 5.4.5 - Flood).

The state and municipalities within it may adopt higher regulatory standards when implementing the provisions of the NFIP. Specifically identified are the following:

Freeboard: By law, NYS requires Base Flood Elevation plus 2 feet (BFE+2) for all construction. When there is a base flood elevation available, the lowest floor, including any basement, must be at or above the base flood elevation (plus two feet beginning in 2007). Elevation may be by means of properly compacted fill, a solid slab foundation, or a "crawl space" foundation, which contains permanent openings to let flood waters in and out. Non-residential structures may be flood-proofed in lieu of elevation. Where a local floodplain administrator has information to estimate a base flood elevation, such as historic flood records or a hydraulic study, that elevation must be used. If the development consists of more than 5 acres or more than 50 lots, the permit applicant must develop a base flood elevation and build accordingly (NYDEC 2018). Communities may go beyond this requirement, providing for additional freeboard. In most New York communities, new structures must have the lowest floor 3 feet or more above the highest adjacent grade.

Cumulative Substantial Improvements/Damages: The NFIP allows improvements valued at up to 50% of the building's pre-improvement value to be permitted without meeting the flood protection requirements. Over the years, a community may issue a succession of permits for different repairs or improvement to the same structures. This can greatly increase the overall flood damage potential for structures within a community. The community may wish to deem "substantial improvement" cumulatively so that once a threshold of improvement within a certain length of time is reached, the structure is considered to be substantially improved and must meet flood protection requirements.

NFIP Community Rating System (CRS)

As an additional component of the NFIP, the CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance (FEMA, 2012).

As of November 2022, there is one community within Monroe County that participate in the CRS program, the Town of Greece. Monroe County is exploring the program requirements of the Community Rating System (CRS) through technical expertise and assistance to guide interested municipalities through the application process, as well as help maintain and enhance their participation in the program.

U.S. Army Corps of Engineers

Under Section 404(e) of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) can issue general permits to authorize activities that have only minimal individual and cumulative adverse environmental effects. A nationwide permit (NWP) is a general permit that authorizes activities across the country unless a district or





division commander revokes the nationwide permit in a state or other geographic region. There are 54 nationwide permits, and they authorize a wide variety of activities, including linear transportation projects, bank stabilization activities, residential development, commercial and industrial developments, aids to navigation and certain (USACE Details each NWP found maintenance activities 2017). on can be here: https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/6711.

There are three types of USACE permits: standard, nationwide (described above), and regional. Standard permits are individual permits that involve full public interest review of an individual permit application and includes the issuance of a public notice for any project that does not meet the terms and conditions of an NWP or a Letter of Permission (LOP). Regional general permits are for small, specialized projects. In New York State, there are six regional general permit categories (see https://www.lrb.usace.army.mil/Missions/Regulatory/New-York-Permit-Information/) (USACE Buffalo District 2019).

New York State Floodplain Management

There are two departments that have statutory authorities and programs that affect floodplain management at the local jurisdiction level in New York State: the NYSDEC and the Department of State's Division of Code Enforcement and Administration (DCEA).

The NYSDEC is charged with conserving, improving, and protecting the state's natural resources and environment, and preventing, abating, and controlling water, land, and air pollution. Programs that have bearing on floodplain management are managed by the Bureau of Flood Protection and Dam Safety, which cooperates with federal, state, regional, and local partners to protect lives and property from floods, coastal erosion, and dam failures. These objectives are accomplished through floodplain management and both structural and nonstructural means.

The Dam Safety Section is responsible for "reviewing repairs and modifications to dams and assuring [sic] that dam owners operate and maintain dams in a safe condition through inspections, technical reviews, enforcement, and emergency planning." The Flood Control Projects Section is responsible for reducing flood risk to life and property through construction, operation, and maintenance of flood control facilities.

The Floodplain Management Section is responsible for reducing flood risk to life and property through management of activities, such as development in flood hazard areas, and for reviewing and developing revised flood maps. The Section serves as the NFIP State Coordinating Agency and, in this capacity, is the liaison between FEMA and New York communities that elect to participate in the NFIP. The Section provides a wide range of technical assistance.

Stormwater Management Planning

When proper controls are not in place, research studies show a clear link between urbanization and increased flooding and pollutant export. The goal of stormwater management is to ensure that the quantity and quality of stormwater runoff from a site that is undergoing construction or development should not be substantially altered from its pre-development conditions (NYSDEC 2015).

According to the federal law commonly known as Stormwater Phase II, permits are required for stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas and those additionally designated by the New York State Department of Environmental Conservation (NYSDEC). Owners or operators of such MS4s must be authorized in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems. The permit requires development of a Stormwater Management Program (SWMP).





6.4.3 Administrative and Technical Capabilities - County and Local

This subsection provides a summary of capabilities to support hazard mitigation for local jurisdictions, some of whom sat on the Steering Committee and others who provide a resource for support and information to communities. Specific local capabilities (e.g., police, fire, EMS, highway and public works departments, etc.) are provided in Section 9 (Jurisdictional Annexes).

Monroe County Department of Public Safety

The Monroe County Department of Public Safety, through the effective, dedicated efforts of its divisions, contractors, employees, volunteers, and the community, provides education, prevention, technical support, interagency coordination and direct services that meet or exceed the expectations of the courts, individuals, and the public and private agencies receiving these services in order to enhance the quality of life in Monroe County, NY. The Department of Public Safety includes the Divisions of Communications & Radio Center, Emergency Management, Emergency Medical Services, Fire Bureau, and Safety and Security.

The Department led and helped to organize the update of this Hazard Mitigation Plan and was also an active participant in the Steering Committee.

Monroe County Planning and Development Department

The Monroe County Planning and Development Department coordinates a broad range of programs, including those for land use planning and resource integration. The Department supports programs that meet multiple objectives, e.g., quality land use planning and economic development. Land use planning in the County also considers impacts of potential hazard areas. The County Planning Department participates in hazard mitigation planning efforts directed through the County OEM. The Department also provides technical support to municipal planning agencies and provides training programs for professionals, residents, elected officials, and board members. The County Planning Board does not review development proposals—only the County Capital Improvement Plan. County Planning staff provide technical assistance to various planning activities within the County.

For more information about the County's Planning activities please visit <u>https://www.monroecounty.gov/planning-planning</u>.

Monroe County Department of Health

The Monroe County Department of Health protects the health and safety of Monroe County residents and visitors. Through a wide range of services, we prevent disease, promote healthy habits, and improve quality of life.

Monroe County Legislature

The Legislature serves as the governing body of the County. Each legislator represents a district of approximately 25,000 people. The Legislature has numerous standing committees including:

- Agenda/Charter
- Environment and Public Works
- Intergovernmental Relations
- Planning and Economic Development
- Recreation and Education
- Human Services
- Transportation





- Public Safety
- Ways and Means

Monroe County Department of Environmental Services

The Monroe County Department of Environmental Services (DES) combines advanced wastewater and solid waste management into one sophisticated and proactive organization. DES is comprised of the following divisions:

- The Division of Pure Waters was established by the County Legislature to implement the Pure Waters Master Plan to reduce the levels of pollution in Irondequoit Bay, the Genesee River, areas of Lake Ontario and other waters of Monroe County to safe and healthy levels. Pure Waters' staff manages four geographic districts containing several miles of major interceptor tunnel, two wastewater treatment facilities, pump stations and the sewer collection systems for the Rochester and Gates-Chili-Ogden districts. Collection sewers in the other districts are operated, maintained, and funded by local municipalities. The districts obtain the majority of their revenue from user charges. The County Legislature, which is also the Pure Waters Administrative Board, oversees the districts, approves contracts, holds public hearings, establishes annual rates, and approves Pure Water's annual operating budget.
- Solid Waste and Recycling is responsible for solid waste management and recycling, guided through the Local Solid Waste Management Plan (LSWMP).
- The Geographic Information System (GIS) Services Division manages Monroe County's interagency GIS program. The GIS Services Division provides leadership, coordination, infrastructure, education, and a variety of services to realize the full potential of a Community GIS. The mission of the GIS Services Division is to develop a fully integrated GIS that will support the needs of all Monroe County Departments, the City of Rochester, and local towns and villages. The division fosters Countywide access to current, accurate spatial information and the elimination of duplication of effort.
- The Division of Engineering provides professional engineering and construction services to County departments (e.g., Transportation, Parks, Aviation, MCC, Sheriff, Facilities, Community Hospital, and Pure Waters) that require technical support for capital planning, engineering design, and construction management. The Division is also responsible for overseeing all real estate functions within the County including leasing of County-owned/required space and facilities, lease management, acquisition and disposition of real estate, open space acquisition, easements, right-of-way, options, licenses and permits. Topographic surveys are also conducted and coordinated by the Division. In addition, the Division enforces the NYS Unified Building Code, issues demolition and building permits and certificates of occupancy, and manages ADA accessibility compliance for over 400 County owned and leased facilities.
- The Fleet Division of Monroe County's Department of Environmental Services (DES) is responsible for managing a diverse fleet of licensed and non-licensed motor vehicles, construction, maintenance, and snow removal equipment, and firefighting and other specialized vehicles including repairs to light, medium and heavy-duty vehicles and equipment at a centralized Fleet Center facility located on Paul Road, adjacent to the Greater Rochester International Airport. The Fleet Division has received the distinction of being recognized as one of the top municipal operations in the country, in large part due to its leadership with "green" fuels.

The staff members of these divisions work together, both in the office and out in the field, to minimize the adverse impacts that the County's population has on its surrounding land and waterways.





Monroe County Department of Transportation

The Monroe County Department of Transportation is responsible for the safe and efficient operation and maintenance of approximately 1,500 lane miles (665 centerline miles) of County-owned highways, 180 bridges, 275 major culverts, and 805 traffic signal and flasher devices on the Monroe County highway system. In addition, the department is responsible for:

- County-wide traffic, highway, and bridge engineering;
- County-wide road sign fabrication, installation, and maintenance;
- County-wide pavement marking;
- installation and maintenance of all traffic control devices on County highways and streets within the City of Rochester;
- operating and maintaining 4,530 light fixtures along the Rochester area expressway system;
- operating and maintaining 760 light fixtures along some state highways and 240 light fixtures along some County highways;
- highway permit issuance for construction activities along County highway right-of-ways;
- assisting the Towns and Villages with traffic engineering needs upon request;
- providing surveying and mapping services; and
- administering the In Bloom and the ADOPT-A-HIGHWAY programs.

To accomplish its work, the department is divided into five divisions:

- Highway Engineering and Operations
- Bridge Engineering and Operations
- Traffic Operations and Permits
- Traffic Signal Engineering and Operations
- Project Planning and Administration

Stormwater Coalition of Monroe County

Established in 2000, the Stormwater Coalition of Monroe County is a collective group of 29 municipal representatives from towns and villages throughout the County. Through collaboration the Stormwater Coalition of Monroe County complies with federal and state stormwater regulations. The work of the Coalition is advanced by several task groups including Education, Construction, and Illicit Discharges/Pollution Prevention. The Coalition implements a wide range of projects and programs including public education, training for municipal employees and the land development community, demonstrations of practices that reduce polluted runoff from developed land, technical assistance with permits and erosion control, investigations of stormwater outfalls for indicators of illegal discharges, assessments of municipal facilities for opportunities to prevent pollution.

Monroe County Soil & Water Conservation District (MCSWCD)

The MCSWCD is a municipal subdivision that partners with state, local and federal agencies, as well as watershed groups to educate and assist landowners and municipalities in planning and implementing best management practices that stabilize soil, improve water quality, manage stormwater runoff, preserve open space, and manage fish and wildlife habitat. The District provides technical assistance in the preservation and restoration of streams, wetlands, woodlots, agricultural land and low impact development to landowners, farmers, engineers, contractors, developers, and municipalities.





6.4.4 Administrative and Technical Capabilities - State and Federal

New York State Division of Homeland Security and Emergency Services (NYS DHSES)

For more than 50 years, NYS DHSES (formerly New York State Office of Emergency Management) and its predecessor agencies have been responsible for coordinating the activities of all State agencies to protect New York's communities, the State's economic well-being, and the environment from natural and man-made disasters and emergencies. NYS DHSES routinely assists local governments, voluntary organizations, and private industry through a variety of emergency management programs, including hazard identification, loss prevention, planning, training, operational response to emergencies, technical support, and disaster recovery assistance.

NYS DHSES administers the FEMA mitigation grant programs in the state and supports local mitigation planning in addition to developing and routinely updating the State Hazard Mitigation Plan. NYS DHSES prepared the current State Hazard Mitigation Plan working with input from other State agencies, authorities, and organizations. It was approved by FEMA in 2018, and it keeps New York eligible for recovery assistance in Public Assistance (Categories A through G) and Hazard Mitigation assistance in each of the Unified Hazard Mitigation Assistance Program's five grant programs. The 2019 New York State HMP was used as guidance in completing the Monroe County HMP Update. The State HMP found can be here: https://mitigateny.availabs.org/.

For the purpose of this HMP, representatives from NY DHSES completed stakeholder surveys, provided technical assistance and data, and attended planning partnership meetings. NYS DHSES also presented about state requirements for hazard mitigation plans at the October 2022 Mitigation Action Workshop.

New York State Department of Environmental Conservation (NYSDEC) – Region 9 – Central New York

NYSDEC – Region 9 is located in western New York and includes Allegany, Erie, Chautauqua, Erie, Niagara, and Wyoming counties. The main Department of Environmental Conservation (DEC) office is located in Buffalo with a sub-office in Allegany. DEC staff have two main areas of responsibility: natural resource management and environmental quality protection. As part of natural resource management, staff oversee state fish and wildlife resources as well as state forests (NYSDEC Region 9 2019).

New York State Department of Environmental Conservation (NYSDEC) – Division of Water - Bureau of Flood Protection and Dam Safety

Within the NYSDEC – Division of Water, the Bureau of Flood Protection and Dam Safety (<u>https://www.dec.ny.gov/lands/4991.html</u>) cooperates with federal, state, regional, and local partners to protect lives and property from floods, coastal erosion and dam failures through floodplain management and both structural and nonstructural means; and provides support for information technology needs in the division. The bureau consists of the following sections:

- Coastal Management: Works to reduce coastal erosion and storm damage to protect lives, natural resources, and properties through structural and nonstructural means.
- Dam Safety: Is responsible for reviewing repairs and modifications to dams and assuring that dam owners operate and maintain dams in a safe condition through inspections, technical reviews, enforcement, and emergency planning.
- Flood Control Projects: Is responsible for reducing flood risk to life and property through construction, operation, and maintenance of flood control facilities.





• Floodplain Management: Is responsible for reducing flood risk to life and property through proper management of activities including, development in flood hazard areas and review and development of revised flood maps (NYSDEC Bureau of Flood Protection and Dam Safety 2019).

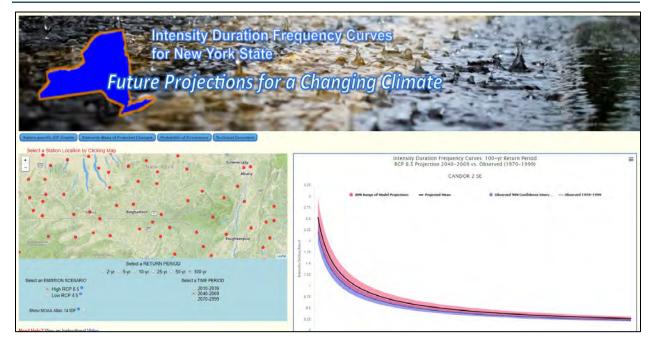
The NYSDEC's Mission is "To conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."

DEC's goal is to achieve this mission through the simultaneous pursuit of environmental quality, public health, economic prosperity, and social well-being, including environmental justice and the empowerment of individuals to participate in environmental decisions that affect their lives.

Northeast Regional Climate Center

The Northeast Regional Climate Center (NRCC) partnered with the New York State Energy Research and Development Authority (NYSERDA) to compare various methods of downscaling global climate model (GCM) output and create extreme precipitation projections for New York State. These projections will ultimately be incorporated into climate change adaptation planning. In 2009 alone, 175 total flooding events in New York State led to \$32.82 million in property damage. The state is also still recovering from the \$42 billion toll of Superstorm Sandy. Climate change is resulting in an increase in the frequency of heavy rainfall events. To help New York State communities plan for effects of climate change, new graphics are now available showing the increased likelihood of heavy precipitation events. These graphs, called Intensity Duration Frequency (IDF) curves, show anticipated increases of storm events from 2- to 100-year intervals and are projected into the future as far as 2099. These products are designed for use by municipal officials, researchers, planners, highway departments, and other decision-makers who need to take storm events into account. These IDF curves display how precipitation events are being affected by New York State's rapidly changing climate (NRCC 2015). Figure 6-1 displays the screenshot of the website.

Figure 6-1. Screenshot of the IDF Curves for New York State

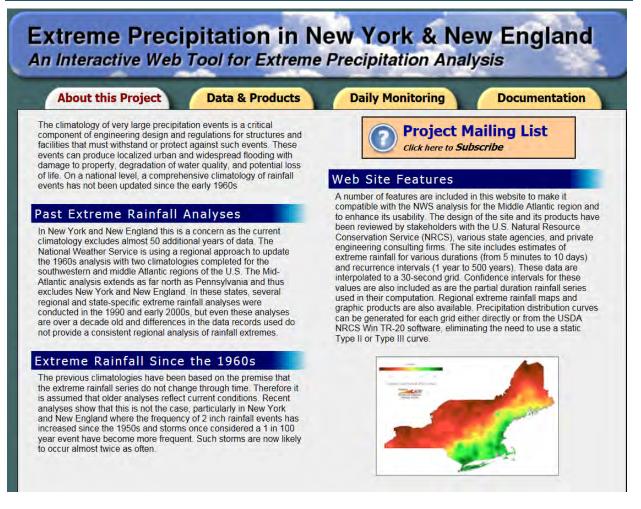






NRCC also maintains the Extreme Precipitation in New York & New England website, an interactive tool for extreme precipitation analysis. The site includes estimates of extreme rainfall for various durations (5 minutes to 10 days) and recurrence intervals (1 year to 500 years). These data are interpolated to a 30-second grid. Confidence intervals for these values are included as are the partial duration rainfall series used in their computation. Regional extreme rainfall maps and graphic products are available. Precipitation distribution curves can be generated for each grid either directly or from the USDA NRCS Win TR-20 software, eliminating the need to use a static Type II or Type III curve (NRCC 2018). This tool can be used by municipalities to assist them in the design and feasibility assessment of future projects and allow them to see the future intensity and frequency of rain events. Figure 6-2 shows a screenshot of the website.

Figure 6-2. Screenshot of the Extreme Precipitation in New York & New England website



Department of State's Division of Code Enforcement and Administration (DCEA)

Technical Bulletins for the 2010 Codes of New York State

The DCEA publishes technical bulletins for its building codes. TB-1004 came into effect in October 2017 and addressed Flood Venting in Foundations and Enclosures in Flood Areas. The bulletin clarifies definitions and requirements with regard to Residential and Building Construction (19NYCRR 1220 and 1221). Bulletins also address requirements for critical facilities such as fire stations, requirements for fire extinguishers, and other hazards.





Forms and Publications

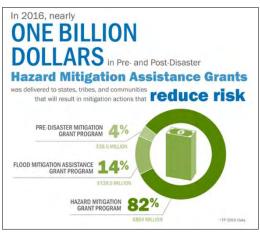
The DCEA posts several model reporting forms and related publications on its web page. The Building Permit Application requests the applicant to indicate whether the site is or is not in a floodplain and advises checking with town clerks or NYSDEC. The General Residential Code Plan Review form includes a reminder to "add 2' freeboard." Sample Flood Hazard Area Review Forms, including plan review checklists and inspection checklists for Zone A and Zone V, are based on the forms in Reducing Flood Losses through the International Code Series published by International Code Council and FEMA (2008).

6.4.5 Fiscal Capabilities – County and Local

Municipal Fiscal Capabilities

Monroe County and individual municipalities are (legally, not necessarily practically) able to fund mitigation projects though existing local budgets, local appropriations (including referendums and bonding), and a variety of federal and state loan and grant programs. Many municipalities noted throughout the planning process that they are faced with increasing fiscal constraints, including decreasing revenues, budget constraints, and tax caps. In an effort to overcome these fiscal challenges, municipalities have continued to leverage the sharing of resources and combining available funding with grants and other sources and note that plans and intermunicipal cooperation are beneficial in obtaining grants.

6.4.6 Fiscal Capabilities – State and Federal



Source: FEMA 2018

The *NYS Capabilities* section of the 2019 New York State Hazard Mitigation Plan features a section on mitigation-related funding administered by state agencies that eligible jurisdictions can use to find mitigation actions. A list of funding opportunities can be accessed here:

https://mitigateny.availabs.org/strategies/funding

As noted on the FEMA hazard mitigation assistance website (https://www.fema.gov/hazard-mitigation-assistance), FEMA administers five programs that provide funding for eligible mitigation planning and projects that reduces disaster losses and protect life and property from future disaster damages. The programs are the Hazard Mitigation Grant Program (HMGP), and the HMGP Post Fire Grant, the Flood Mitigation Assistance (FMA) Program, the Pre-Disaster Mitigation (PDM) Program,

and the new Building Resilient Infrastructure & Communities (BRIC) Program.

HMGP assists in implementing long-term hazard mitigation planning and projects following a Presidential major disaster declaration. PDM provides funds for hazard mitigation planning and projects on an annual basis. FMA provides funds for planning and projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis. BRIC supports jurisdictions in hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program will replace the existing Pre-Disaster Mitigation (PDM) program. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency (FEMA 2020).





HMGP funding is generally 15 percent of the total amount of Federal assistance provided to a State, Territory, or federally recognized tribe following a major disaster declaration. PDM and FMA funding depends on the amount congress appropriates each year for those programs. BRIC is funded by a 6 percent (\$500 million) set-aside from federal post-disaster grant funding.

Individual homeowners and business owners may not apply directly to FEMA. Eligible local governments may apply on their behalf (FEMA 2020).

Table 6-2 provides an overview of program funding eligibility and cost share.

Table 6-2. FEMA HMA Grant Cost Share Requirements

Programs	Cost Share (Percent of Federal / Non-Federal Share)
HMGP	75 / 25
FMA – insured properties and planning grants	75 / 25
FMA – repetitive loss property ⁽²⁾	90 / 10
FMA – severe repetitive loss property ⁽²⁾	100 / 0
BRIC	75 / 25
BRIC - subrecipient is small and impoverished community	90 / 10

Source: FEMA HMA Guidance 2015; Regulations.gov; FEMA 2020

(1) Subapplicants should consult their State Hazard Mitigation Officer (SHMO) for the amount of percentage of HMGP subrecipient management cost funding their State has determined to be passed through subrecipients.

(2) To be eligible for an increased federal cost share, a FEMA-approved state or tribal (standard or enhanced) mitigation plan that addressed repetitive loss properties must be in effect at the time of award, and the property is being submitted for consideration must be a repetitive loss property.

Federal Hazard Mitigation Funding Opportunities

Federal mitigation grant funding is available to all communities with a current hazard mitigation plan (this plan); however, most of these grants require a "local share" in the range of 10-25 percent of the total grant amount. Details about this program and a further description of these opportunities can be found at: https://www.fema.gov/hazard-mitigation-assistance. The FEMA mitigation grant programs are described below.

Hazard Mitigation Grant Program (HMGP)

The HMGP is a post-disaster mitigation program. It is made available to states by FEMA after each Federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures. The HMGP can be used to fund cost-effective projects that will protect public or private property in an area covered by a federal disaster declaration or that will reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard-prone areas, flood-proofing or elevation to reduce future damage, minor structural improvements, and development of state or local standards. Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved Hazard Mitigation Plan (this plan).

Applicants who are eligible for the HMGP are state and local governments, certain nonprofit organizations or institutions that perform essential government services, and Indian tribes and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf. Applications are submitted to NYS DHSES and placed in rank order for available funding and submitted to FEMA for final approval. Eligible projects not selected for funding are placed in an inactive status and may be





considered as additional HMGP funding becomes available. For additional information regarding HMGP, please refer to: <u>https://www.fema.gov/hazard-mitigation-grant-program</u>

Flood Mitigation Assistance (FMA) Program

The FMA program combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant program. The FMA provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is at least 75 percent. At most, 25 percent of the total eligible costs must be provided by a non-federal source. Of this 25 percent, no more than half can be provided as in-kind contributions from third parties. At minimum, a FEMA-approved local flood mitigation plan is required before a project can be approved. The FMA funds are distributed from FEMA to the state. The NYS DHSES serves as the grantee and program administrator for the FMA program.

For additional information regarding the FMA program, please refer to: <u>https://www.fema.gov/flood-mitigation-assistance-grant-program</u>

Building Resilient Infrastructure and Communities (BRIC) Program

Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program.

The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

For additional information regarding the BRIC program, please refer to: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

Rehabilitation of High Hazard Potential Dams (HHPD) Program

The Rehabilitation of High Hazard Potential Dams (HHPD) grant program provides technical, planning, design, and construction assistance for eligible rehabilitation activities that reduce dam risk and increase community preparedness.

The HHPD Grant Program will provide assistance for technical, planning, design, and construction activities toward:

- Repair
- Removal
- Structural/nonstructural rehabilitation of eligible high hazard potential dams

For additional information regarding the HHPD program, please refer to: <u>https://www.fema.gov/emergency-managers/risk-management/dam-safety/grants/resources</u>.





Extraordinary Circumstances

For BRIC and FMA project subawards, the (FEMA) Region may apply extraordinary circumstances when justification is provided and with concurrence from FEMA Headquarters (Risk Reduction and Risk Analysis Divisions) prior to granting an exception. If this exception is granted, a local mitigation plan must be approved by FEMA within 12 months of the award of the project subaward to that community.

For HMGP, BRIC, and FMA, extraordinary circumstances exist when a determination is made by the Applicant and FEMA that the proposed project is consistent with the priorities and strategies identified in the State (Standard or Enhanced) Mitigation Plan and that the jurisdiction meets at least one of the criteria below. If the jurisdiction does not meet at least one of these criteria, the Region must coordinate with FEMA Headquarters (Risk Reduction and Risk Analysis Divisions) for HMGP; however, for BRIC and FMA the Region must coordinate and seek concurrence prior to granting an exception:

- The jurisdiction meets the small, impoverished community criteria (see Part VIII, B.2).
- The jurisdiction has been determined to have had insufficient capacity due to lack of available funding, staffing, or other necessary expertise to satisfy the mitigation planning requirement prior to the current disaster or application deadline.
- The jurisdiction has been determined to have been at low risk from hazards because of low frequency of occurrence or minimal damage from previous occurrences as a result of sparse development.
- The jurisdiction experienced significant disruption from a declared disaster or another event that impacts its ability to complete the mitigation planning process prior to award or final approval of a project award.
- The jurisdiction does not have a mitigation plan for reasons beyond the control of the State, federallyrecognized tribe, or local community, such as Disaster Relief Fund restrictions that delay FEMA from granting a subaward prior to the expiration of the local or Tribal Mitigation Plan.

For HMGP, BRIC, and FMA, the Applicant must provide written justification that identifies the specific criteria or circumstance listed above, explains why there is no longer an impediment to satisfying the mitigation planning requirement and identifies the specific actions or circumstances that eliminated the deficiency.

When an HMGP project funding is awarded under extraordinary circumstances, the Recipient shall acknowledge in writing to the Regional Administrator that a plan will be completed within 12 months of the subaward. The Recipient must provide a work plan for completing the local or Tribal Mitigation Plan, including milestones and a timetable, to ensure that the jurisdiction will complete the plan in the required time. This requirement shall be incorporated into the award (both the planning and project subaward agreements if a planning subaward is also awarded).

Federal and State Disaster and Recovery Assistance Programs

Following a disaster, various types of assistance may be made available by local, state, and federal governments. The types and levels of disaster assistance depend on the severity of the damage and the declarations that result from the disaster event. Among the general types of assistance that may be provided should the President of the United States declare the event a major disaster includes the following:

Individual Assistance (IA)

IA provides help for homeowners, renters, businesses, and some nonprofit entities after disasters occur. This program is largely funded by the U.S. Small Business Administration. For homeowners and renters, those who suffered uninsured or underinsured losses may be eligible for a Home Disaster Loan to repair or replace damaged real estate or personal property. Renters are eligible for loans to cover personal property losses. Individuals may borrow up to \$200,000 to repair or replace real estate, \$40,000 to cover losses to personal property, and an





additional 20 percent for mitigation. For businesses, loans may be made to repair or replace disaster damages to property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Businesses of any size are eligible. Nonprofit organizations such as charities, churches, private universities, etc. are also eligible. An Economic Injury Disaster Loan provides necessary working capital until normal operations resume after a physical disaster. These loans are restricted, by law, to small businesses only. For additional information regarding IA, please refer to: https://www.fema.gov/individual-disaster-assistance

Public Assistance (PA)

PA provides cost reimbursement aid to local governments (state, county, local, municipal authorities, and school districts) and certain nonprofit agencies that were involved in disaster response and recovery programs or that suffered loss or damage to facilities or property used to deliver government-like services. This program is largely funded by FEMA with both local and state matching contributions required. For additional information regarding PA, please refer to: <u>https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit</u>

Small Business Administration (SBA) Loans

SBA provides low-interest disaster loans to homeowners, renters, business of all sizes, and most private nonprofit organizations. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.

Homeowners may apply for up to \$200,000 to replace or repair their primary residence. Renters and homeowners may borrow up to \$40,000 to replace or repair personal property (such as clothing, furniture, cars, and appliances) damaged or destroyed in a disaster. Physical disaster loans of up to \$2 million are available to qualified businesses or most private nonprofit organizations. For additional information regarding SBA loans, please refer to: https://www.sba.gov/managing-business/running-business/emergency-preparedness/disaster-assistance

Social Services Block Grant Program (SSBG)

To address the needs of critical health and human service providers and the populations they serve, the State of New York will receive a total of \$235.4 million in federal Superstorm Sandy SSBG funding. The state will distribute \$200,034,600 through a public and transparent solicitation for proposals and allocate \$35.4 million in State Priority Projects, using the SSBG funding. Sandy SSBG resources are dedicated to covering necessary expenses resulting from Superstorm Sandy, including social, health, and mental health services for individuals, and for repair, renovation, and rebuilding of health care facilities, mental hygiene facilities, childcare facilities, and other social services facilities. Additional information regarding the SSBG program is available on the website: https://www.acf.hhs.gov/ocs/programs/ssbg.

Department of Homeland Security Grant Program (HSGP)

The Homeland Security Grant Program (HSGP) plays an important role in the implementation of the National Preparedness System by supporting the building, sustainment, and delivery of core capabilities essential to achieving the National Preparedness Goal of a secure and resilient nation. The program supports efforts to build and sustain core capabilities across the Prevention, Protection, Mitigation, Response, and Recovery mission areas. This includes two priorities: building and sustaining law enforcement terrorism prevention capabilities and maturation and enhancement of state and major urban area fusion centers. HSGP is composed of three interconnected grant programs including the State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and the Operation Stonegarden (OPSG). Together, these grant programs fund a range of preparedness activities, including planning, organization, equipment purchase, training, exercises, and management and administration. For additional information regarding HSGP, please refer to: https://www.fema.gov/grants/preparedness/homeland-security





Community Development Block Grants (CDBG)

CDBG are federal funds intended to provide low and moderate-income households with viable communities, including decent housing, as suitable living environment, and expanded economic opportunities. Eligible activities include community facilities and improvements, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, planning, and administration. Public improvements may include flood and drainage improvements. In limited instances, and during the times of "urgent need" (e.g., post-disaster) as defined by the CDBG National Objectives, CDBG funding may be used to acquire a property located in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event. For additional information regarding CDBG, please refer to: https://www.hudexchange.info/programs/cdbg-entitlement/

U.S. Economic Development Administration

The U.S. Economic Development Administration (USEDA) is an agency of the U.S. Department of Commerce that supports regional economic development in communities around the country. It provides funding to support comprehensive planning and makes strategic investments that foster employment creation and attract private investment in economically distressed areas of the United States. Through its Public Works Program, USEDA invests in key public infrastructure, such as in traditional public works projects, including water and sewer systems improvements, expansion of port and harbor facilities, brownfields, multitenant manufacturing and other facilities, business and industrial parks, business incubator facilities, redevelopment technology-based facilities, telecommunications, and development facilities. Through its Economic Adjustment Program, USEDA administers its Revolving Loan Fund (RLF) Program, which supplies small businesses and entrepreneurs with the gap financing needed to start or expand their business, in areas that have experienced or are under threat of serious structural damage to the underlying economic base. Please refer to the USEDA website (https://www.eda.gov/) for additional information.

Federal Highway Administration - Emergency Relief (FHWA-ER)

The FHWA- ER is a grant program that may be used for repair or reconstruction of Federal-aid highways and roads on Federal lands which have suffered serious damage as a result of a disaster. NYS is serving as the liaison between local municipalities and FHWA. \$30 million in funding was released in October–November of 2012 for emergency repair work conducted in the first 180 days following Hurricane Sandy. Another \$220 million in additional funding became available February 2013. For information regarding the FHWA-ER Program, please refer to: https://www.fhwa.dot.gov/programadmin/erelief.cfm

Federal Transit Administration - Emergency Relief (FTA-ER)

The FTA-ER is a grant program that funds capital projects to protect, repair, reconstruct, or replace equipment and facilities of public transportation systems. Administered by the Federal Transit Authority at the U.S. Department of Transportation and directly allocated to metropolitan transit authorities (MTA) and port authorities, this transportation-specific fund was created as an alternative to FEMA PA. Currently, a total of \$5.2 billion has been allocated to NYS-related entities. For information regarding the FTA-ER Program, please refer to: <a href="https://www.transit.dot.gov/funding/grant-programs/emergency-relief-program/emergenc

State Hazard Mitigation Funding Opportunities

Empire State Development

Empire State Development offers a wide range of financing, grants, and incentives to promote business and employment growth, and real estate development throughout the State. Several programs address infrastructure





construction associated with project development, acquisition, and demolition associated with project development and brownfield remediation and redevelopment. For additional information regarding Empire State Development, please refer to: <u>https://esd.ny.gov/</u>

Local Waterfront Revitalization Program

The Waterfront Revitalization of Coastal Areas and Inland Waterways Act offers local governments the opportunity to participate in the State's Coastal Management Program (CMP) (pdf) on a voluntary basis by preparing and adopting a LWRP, providing more detailed implementation of the State's CMP through use of such existing broad powers as zoning and site plan review. When an LWRP is approved by the New York State Secretary of State, State agency actions are required to be consistent with the approved LWRP to the maximum extent practicable. When the federal government concurs with the incorporation of an LWRP into the CMP, federal agency actions must be consistent with the approved addition to the CMP.

An approved LWRP reflects community consensus and provides a clear direction for appropriate future development. It establishes a long-term partnership among local government, community-based organizations, and the State. Also, funding to advance preparation, refinement, or implementation of Local Waterfront Revitalization Programs is available under Title 11 of the New York State EPF LWRP, among other sources.

In addition, State permitting, funding, and direct actions must be consistent, to the maximum extent practicable, with an approved LWRP. Within the federally defined coastal area, federal agency activities are also required to be consistent with an approved LWRP. This "consistency" provision is a strong tool that helps ensure all government levels work in unison to build a stronger economy and a healthier environment.

New York State Department of Transportation (NYSDOT)

Scour Critical/Flood Prone Bridge Program

The Scour Critical/Flood Prone Bridge Program is an initiative developed to harden New York State's at-risk bridges to withstand extreme weather events. In the past three years, the State has suffered nine presidentially declared disasters due to extreme weather, many involving severe flooding (NYSDOT 2015).

For this initiative, 105 scour critical/flood prone bridges (<u>https://www.dot.ny.gov/main/business-center/cbow/repository/CBOW_list_2015.pdf</u>) throughout New York State were identified as most at-risk from repeated flooding and are located in the Capital District, Long Island, Mid-Hudson, Mohawk Valley, North Country, Finger Lakes, Central/Western and Southern Tier regions. The locations encompass 78 communities within 30 counties across the State (NYSDOT 2015).

All of the bridges included in this program were built to the codes and standards of their time and remain safe and open for everyday traffic. However, due to a variety of natural severe weather events and the increasing frequency of major storms and floods, they are vulnerable to scour, and flooding caused by the intensity and velocity of water from extreme natural events. Bridge scour erodes and carries away foundation materials such as sand and rocks from around and beneath bridge abutments, piers, foundations, and embankments (NYSDOT 2015).

This program encompasses a variety of bridge improvement work, including upgrading concrete bridge abutments and/or piers by adding steel or concrete pile foundations, increasing the size of waterway openings to meet 100-year flood projections and reducing or eliminating the number of bridge piers in the water to prevent debris and ice jams that can flood surrounding areas. Completion of the program will ensure continual access to critical facilities and essential personnel during emergency events. Adverse impacts to travel throughout the State will be greatly reduced during severe weather events as well (NYSDOT 2015).





Through HMGP, this program aims to increase the State's resiliency and mitigate the risks of loss and damage associated with future disasters. The total cost of the program, including all 105 bridges across the state, is \$518 million. It will be paid for with a mix of funding from FEMA and the U.S. Department of Housing and Urban Development. No state funding will be required (NYSDOT 2015).

Emergency Watershed Protection Program

The purpose of the Emergency Watershed Protection Program (EWP) was established by Congress to respond to emergencies created by natural disasters. The EWP Program is designed to help people and conserve natural resources by relieving imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences. The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) administers the EWP Program; EWP-Recovery, and EWP–Floodplain Easement (FPE). For additional information regarding the EWP, please refer to:

https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/

EWP - Recovery

The EWP Program is a recovery effort program aimed at relieving imminent hazards to life and property caused by floods, fires, windstorms, and other natural occurrences. Public and private landowners are eligible for assistance but must be represented by a project sponsor that must be a legal subdivision of the State, such as a city, county, township or conservation district, and Native American Tribes or Tribal governments. NRCS may pay up to 75 percent of the construction cost of emergency measures. The remaining 25 percent must come from local sources and can be in the form of cash or in-kind services.

EWP work is not limited to any one set of measures. It is designed for installation of recovery measures to safeguard lives and property as a result of a natural disaster. NRCS completes a Damage Survey Report (DSR) which provides a case-by-case investigation of the work necessary to repair or protect a site.

Watershed impairments that the EWP Program addresses are debris-clogged stream channels, undermined and unstable streambanks, jeopardized water control structures and public infrastructures, wind-borne debris removal, and damaged upland sites stripped of protective vegetation by fire or drought.

EWP - Floodplain Easement (FPE)

Privately-owned lands or lands owned by local and state governments may be eligible for participation in EWP-FPE. To be eligible, lands must meet one of the following criteria:

- Lands that have been damaged by flooding at least once within the previous calendar year or have been subject to flood damage at least twice within the previous 10 years
- Other lands within the floodplain are eligible, provided the lands would contribute to the restoration of the flood storage and flow, provide for control of erosion, or that would improve the practical management of the floodplain easement
- Lands that would be inundated or adversely impacted as a result of a dam breach

EWP-FPE easements are restored to the extent practicable to the natural environment and may include both structural and nonstructural practices to restore the flood storage and flow, erosion control, and improve the practical management of the easement.

Structures, including buildings, within the floodplain easement must be demolished and removed or relocated outside the 100-year floodplain or dam breach inundation area.





New York State Department of Environmental Conservation Climate Smart Communities (CSC) Program

The CSC program is jointly sponsored by the following six New York State agencies: DEC; Energy Research and Development Authority; Public Service Commission; Department of State; NYSDOT; and the Department of Health. The program encourages municipalities to minimize the risks of climate change and reduce long-term costs through actions which reduce greenhouse gas emissions and adapt to a changing climate. The program offers free technical support on energy and climate and guidance tailored to New York State communities. As of April 2020, more than 303 communities, representing 8.7 million New Yorkers in every region of the state, have committed to acting on climate through New York State's Climate Smart Communities program.

Benefits of participating in the program include saving taxpayer dollars, improving operations and infrastructure, increasing energy independence and security, demonstrating leadership, and positioning for economic growth. Registered Climate Smart Communities receive notification of state and federal assistance that they can leverage to help adopt low-carbon technologies and of programs and support for efficiency improvements and energy conservation. Further, those communities receive an advantage in accessing some state assistance programs, can call on the help of other local governments that already have adopted climate smart practices and policies, and receive statewide recognition for their climate-smart accomplishments. Key elements of the Climate Smart Communities program are described below.

For additional information regarding the CSC program, please refer to: https://climatesmart.ny.gov/

Climate Smart Communities Pledge

Any city, town, village, or county in New York can join the program by adopting the Climate Smart Communities Pledge. To become a registered Climate Smart Community, the municipality's governing body must adopt a resolution that includes all 10 elements of the Pledge and inform DEC of the passage of the resolution. The required 10 elements of the Pledge are as follows:

- Pledge to be a Climate Smart Community.
- Set goals, inventory emissions, plan for climate action.
- Decrease community energy use.
- Increase community use of renewable energy.
- Realize benefits of recycling and other climate smart solid waste management practices.
- Reduce greenhouse gas emissions through use of climate smart land use tools.
- Enhance community resilience and prepare for the effects of climate change.
- Support development of a green innovation economy.
- Inform and inspire the public.
- Commit to an evolving process of climate action.

Numerous communities in Monroe County have registered to take the Climate Smart Communities Pledge.

Climate Smart Communities Certification (CSC) Program

The Climate Smart Communities Certification (CSC) program enables high-performing registered communities to achieve recognition for their leadership. Designed around the existing ten pledge elements, the certification program recognizes communities achieving any on over 130 total possible actions through a rating system leading to four levels of award: Certified, Bronze, Silver, and Gold. Recertification of completed actions is required every five years. Details of the program and the specific documentation required for each action are described in the CSC Certification Manual at https://climatesmart.ny.gov/actions-certification/actions/





At the time of this plan update, two communities have achieved certification: Town of Brighton and the Town of Pittsford.

Climate Smart Communities Grant Program

In 2019 DEC announced an expansion of the Environmental Protection Fund to support communities ready to reduce greenhouse gas emissions and prepare for the effects of climate change. Climate Smart Community Implementation grants support mitigation and adaptation projects and range from \$100,000 to \$2 million. Competitive grants have typically ranged from \$25,000 to \$100,000 will also provide support for local governments to become certified Climate Smart Communities. All counties, cities, towns, and villages of the State of New York are eligible to receive funding. The CSC Grant Program will provide 50/50 matching grants for eligible projects in the following categories.

Funding is available for implementation projects that advance a variety of climate adaptation and mitigation actions, including the following:

- Construction of natural resiliency measures
- Relocation or retrofit of climate-vulnerable facilities
- Conservation or restoration of riparian areas and tidal marsh migration areas
- Reduction of flood risk
- Clean transportation
- Reduction or recycling of food waste

Funding is also available for **certification projects** that advance several specific actions aligned with Climate Smart Communities Certification requirements:

- Right-sizing of government fleets
- Developing natural resource inventories
- Conducting vulnerability assessments
- Developing climate adaptation strategies
- Updating hazard mitigation plans to address changing conditions and reduce climate vulnerability

In scoring grant applications, increasing points are awarded to communities who have already taken the CSC pledge and to those that have achieved certification status. All grant recipients must take the Climate Smart Communities Pledge within the term of their grant contract. For climate mitigation projects, grant recipients must provide a report of estimates of emissions reduction. Certification actions must adhere to the requirements and standards described in the Climate Smart Communities Certification Manual that is available on the website: https://www.dec.ny.gov/energy/76483.html. For implementation projects involving property (construction, improvements, restoration, rehabilitation), grant recipients that do not have ownership of the property must obtain a climate change mitigation easement.

The Climate Smart Communities Toolkit was developed to educate New York communities on recommended practices that will help to reduce greenhouse gas emissions and adapt to the effects of climate change, specifically in the areas of land-use, transportation policy, green buildings, infrastructure investment, green infrastructure, housing policy, adaptation, and resilience. The Climate Smart Communities Guide to Local Action contains overviews of possible community actions, how-to's and case studies to help communities implement the CSC pledge. The Climate Smart Communities Land Use Toolkit allows New York communities to find recommended practices that will help to reduce greenhouse gas emissions in the areas of land use, transportation policy, green building, infrastructure investment, green infrastructure, and housing policy.





New York State Department of Environmental Conservation (NYSDEC)

Water Quality Improvement Project (WQIP) Program

The WQIP program is a competitive reimbursement grant program that funds projects that directly address documented water quality impairments. The competitive, statewide grant program is open to local governments and not-for-profit corporations. Grant recipients may receive up to 75 percent of the project costs for high priority wastewater treatment improvement, non-agricultural nonpoint source abatement and control, land acquisition for source water protection, aquatic habitat restoration, and municipal separate storm sewer system projects; up to 50 percent for salt storage projects; and up to 40 percent for general wastewater infrastructure improvement projects. Eligible activities include:

- Wastewater treatment improvement
- Non-agricultural nonpoint source abatement and control
- Land acquisition for source water protection
- Salt storage
- Aquatic habitat restoration
- Municipal separate storm sewer systems (MS4)

Details regarding this program are available here: <u>https://www.dec.ny.gov/pubs/4774.html</u>.

New York State DEC/Environmental Facilities Corporation (EFC) Grants

The New York State DEC, in conjunction with the New York State EFC, will offer grants to municipalities to help pay for eligible water quality projects.

Engineering Planning Grants (EPG) help fund the development of an engineering report. Engineering reports are required in the EFC financing application process. Grants are available to help municipalities jump start their work early on with funding for initial planning, so they can be better prepared to seek financing to help them complete their wastewater, sewer, and water quality projects. Grants of up to \$100,000 are available to municipalities to help fund an engineering report.

The Green Innovation Grant Program (GIGP) supports projects across New York State that utilize unique EPAdesignated green stormwater infrastructure design and create cutting-edge green technologies. Competitive grants are awarded annually to projects that improve water quality and mitigate the effects of climate change through the implementation of one or more of the following green practices: Green Stormwater Infrastructure, Energy Efficiency, Water Efficiency and Environmental Innovation.

Water Infrastructure Improvement & Intermunicipal Grants (WIIA) provides competitive grants to help municipalities fund water quality infrastructure projects. WIIA grants are available for wastewater and drinking water projects that protect or improve water quality and/or protect public health. Municipalities may submit applications for multiple projects, including wastewater, sewer and drinking water projects.

Intermunicipal Grants (IMG) is available for both drinking water and wastewater/sewer (clean water) projects that serve multiple municipalities, such as a shared water quality infrastructure project or the interconnection of multiple municipal water systems.

Details regarding this program can be found here: https://efc.ny.gov/wiia





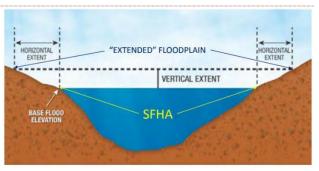
New York State Department of Transportation

BRIDGE NY

The BRIDGE NY program, administered by the NYSDOT, is open to all municipal owners of bridges and culverts. Projects will be awarded through a competitive process and will support all phases of project development. Projects selected for funding under the BRIDGE NY Initiative will be evaluated based on the resiliency of the structure, including such factors as hydraulic vulnerability and structural resiliency; the significance and importance of the bridge including traffic volumes, detour considerations, number and types of businesses served and impacts on commerce; and the current bridge and culvert structural conditions. Information regarding the program can be found here: <u>https://www.dot.ny.gov/BRIDGENY</u>

Community Risk and Resiliency Act (CRRA)

On September 22, 2015, Governor Andrew Cuomo signed bill A06558/S06617-B, the CRRA. The purpose of the bill is to ensure that certain state monies, facility-siting regulations, and permits include consideration of the effects of climate risk and extreme weather events. The bill's provisions will apply to all applications and permits no later than January 1, 2017. CRRA includes five major provisions:



- Official Sea-Level Rise Projections CRRA requires the DEC to adopt science-based sea-level rise projections into regulation.
- Consideration of Sea-Level Rise, Storm Surge and Flooding CRRA requires applicants for permits or funding in a number of specified programs to demonstrate that future physical climate risk due to sealevel rise, storm surge, and flooding have been considered, and that DEC consider incorporating these factors into certain facility-siting regulations.
- Smart-Growth Public Infrastructure Policy Act Criteria CRRA adds mitigation of risk due to sea-level rise, storm surge, and flooding to the list of smart-growth criteria to be considered by state public infrastructure agencies.
- Guidance on Natural Resiliency Measures CRRA requires DEC, in consultation with the Department of State (DOS), to develop guidance on the use of natural resources and natural processes to enhance community resiliency.
- Model Local Laws Concerning Climate Risk CRRA requires DOS, in cooperation with DEC, to develop model local laws that include consideration of future risk due to sea-level rise, storm surge and/or flooding. These model local laws must be based on available data predicting the likelihood of extreme weather events, including hazard risk analysis (NYSDEC 2020).

CRRA requires NYSDEC, in consultation with DOS, to prepare guidance on implementation of the statute. To meet its obligation to develop guidance for the implementation of CRRA, DEC is proposing a new document, State Flood Risk Management Guidance (SFRMG). The SFRMG is intended to inform state agencies as they develop program-specific guidance to require that applicants demonstrate consideration of sea-level rise, storm surge, and flooding, as permitted by program-authorizing statutes and operating regulations. The SFRMG incorporates possible future conditions, including the greater risks of coastal flooding presented by sea-level rise and enhanced storm surge and inland flooding expected to result from increasingly frequent extreme precipitation events (NYSDEC 2020).

For additional details on the CRRA, please refer to: https://www.dec.ny.gov/energy/102559.html





6.4.7 Potential Mitigation Funding Sources

While it is important to recognize the mitigation strategies for each jurisdiction to help achieve the mitigation goals and objectives of the (HMP, it is also important to provide sources for funding to implement these strategies. The table below provides a list of programs, descriptions, and links for those seeking funding sources. This table is not intended to be a comprehensive list, but rather a starting point to help identify potential sources of funding for the identified mitigation strategies.





Table 6-3. Mitigation Funding Sources

Program	Description	Lead Agency	Website		
Federal					
Hazard Mitigation Assistance (HMA)	Consister losses and protect life and property from filling disaster damages		https://www.fema.gov/hazard-mitigation-assistance		
Flood Mitigation Assistance (FMA)			https://www.fema.gov/flood-mitigation-assistance- grant-program		
Hazard Mitigation Grant Program (HMGP)	Grants to States and communities for planning and projects providing long-term hazard mitigation measures following a major disaster declaration.	FEMA	https://www.fema.gov/hazard-mitigation-grant- program		
Building Resilient Infrastructure and Communities (BRIC)	Grants to States local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the Pre-Disaster Mitigation (PDM) program.	FEMA	https://www.fema.gov/grants/mitigation/building- resilient-infrastructure-communities		
Public Assistance: Hazard Mitigation Funding Under Section 404 and Section 406	Hazard mitigation discretionary funding available under Section 404 and 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act following a Presidentially declared disaster.	FEMA	https://www.fema.gov/press-release/20220328/fema- hazard-mitigation-grants-404-and- 406#:~:text=Section%20406%20mitigation%20mea sures%20are%20funded%20under%20the.limited%2 0to%20declared%20counties%20and%20eligible%2 0damaged%20facilities.		
Assistance to Firefighters Grant Program	refighters Grant departments, nonaffiliated Emergency Medical Services organizations, and State Fire Training Academies. This funding is for critically needed FEMA		https://www.fema.gov/welcome-assistance- firefighters-grant-program		
Disaster Housing Program	Emergency assistance for housing, including minor repair of home to establish livable conditions, mortgage, and rental assistance.	HUD	https://www.hud.gov/program_offices/public_indian housing/publications/dhap		
HOME Investment Partnerships Program	IOME Investment Grants to local and state government and consortia for permanent and transitional housing (including financial support for property acquisition		https://hcr.ny.gov/new-york-state-home-program- home#:~:text=The%20New%20York%20State%20 HOME%20Program%20is%20administered,decent %2C%20safe%2C%20and%20affordable%20housin g%20within%20the%20State.		
HUD Disaster Recovery Assistance	Grants to fund gaps in available recovery assistance after disasters (including mitigation).	HUD	https://www.hud.gov/info/disasterresources		





Program	Description	Lead Agency	Website	
Section 108 Loan Guarantee	Enables states and local governments participating in the Community Development Block Grant (CDBG) program to obtain federally guaranteed loans for disaster-distressed areas.	HUD	https://www.hudexchange.info/programs/section- 108/	
Smart-Growth Implementation Assistance (SGIA) program	tation (SGIA) affordable housing, infill development, corridor planning, green building, and climate change. Applicants can submit proposals under 4 categories: community regiliance to disasters, job creation, the role of		https://www.epa.gov/smartgrowth	
Partners for Fish and Wildlife	Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats.	U.S. Fish and Wildlife Service	https://www.fws.gov/partners/	
FHWA Emergency Relief Program			https://www.fhwa.dot.gov/programadmin/erelief.cfm	
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Investing in critical road, rail, transit, and port projects across the nation	U.S. DOT	https://www.transportation.gov/RAISEgrants/about	
Community Facilities Direct Loan & Grant Program	This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial, or business undertakings.	USDA	https://www.rd.usda.gov/programs- services/community-facilities-direct-loan-grant- program	
Emergency Loan Program	USDA's Farm Service Agency (FSA) provides emergency loans to help producers recover from production and physical losses due to drought, flooding, other natural disasters or quarantine.	USDA	https://www.fsa.usda.gov/programs-and- services/farm-loan-programs/emergency-farm- loans/index	
Emergency Watershed Protection (EWP) Program	Provide assistance to relieve imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences.	NRCS	https://www.nrcs.usda.gov/programs- initiatives/ewp-emergency-watershed-protection	
Financial Assistance	Financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land.		https://www.nrcs.usda.gov/wps/portal/nrcs/main/nati onal/programs/financial/	
Regional Conservation Partnership Program (RCPP)	The RCPP promotes coordination of NRCS conservation activities with partners that offer value-added contributions to expand the collective ability to address on-farm, watershed, and regional natural resource concerns. Through RCPP, NRCS seeks to co-invest with partners to implement projects that demonstrate innovative solutions to conservation	NRCS	https://www.nrcs.usda.gov/wps/portal/nrcs/main/nati onal/programs/financial/rcpp/	





Program	Description	Lead Agency Website		
- i togi ani	challenges and provide measurable improvements and outcomes tied to the resource concerns they seek to address.	Lead Agency		
Emergency Management Performance Grants (EMPG) Program	Assist local, tribal, territorial, and state governments in enhancing and sustaining all-hazards emergency management capabilities.		https://www.fema.gov/emergency-management- performance-grant-program	
Land & Water Conservation Fund	Matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities (as well as funding for shared federal land acquisition and conservation strategies).		https://www.nps.gov/subjects/lwcf/index.htm	
Coastal Watersheds Grant Program	funding for shared federal land acquisition and conservation strategies). S Restore America's Estuaries, in close coordination with and financial support from EPA, administers the National Estuary Program (NEP) Coastal Watersheds Grant Program. This grant program funds projects within the geographic areas shown here and supports the following Congressionally-set priorities: •Loss of key habitats resulting in significant impacts on fisheries and water quality such as seagrass, mangroves, tidal and freshwater wetlands, forested wetlands, kelp beds, shellfish beds, and coral reefs; •Recurring harmful algae blooms; Nation •Unusual or unexplained marine mammal mortalities; •Proliferation or invasion of species that limit recreational uses, threaten wastewater systems, or cause other ecosystem damage; •Flooding and coastal erosion that may be related to sea-level rise, changing precipitation, or salt marsh, seagrass, or wetland degradation or loss; •Impacts of nutrients and warmer water temperatures on aquatic life and coastal ecosystems, including low dissolved oxygen conditions in estuarine waters; and •Contaminants of emerging concern found in coastal and estuarine waters such as pharmaceuticals, personal care products, and microplastics.		https://estuaries.org/initiatives/watershedgrants/	
Rehabilitation of High Hazard Potential Dams Grant Program	The main objective of the HHPD grant program is to provide technical, planning, design, and construction assistance in the form of grants to non-federal sponsors for rehabilitation of eligible high hazard potential dams.	FEMA	https://www.fema.gov/emergency-managers/risk- management/dam-safety/grants/resources	
State				
Local Government Records Management Improvement Fund (LGRMIF) Disaster Recovery Grants	Grants for disaster recovery projects related to damage caused by a sudden, unexpected event involving fire, water, man-made or natural phenomena where a timely response is necessary to prevent the irretrievable loss of vital or archival records, or to ensure reasonable, timely access to vital records.	New York State Archives / New York State Education Department	http://www.archives.nysed.gov/grants/grants_lgrmif. shtml	





Program	Description	Lead Agency	Website	
The New York State Emergency Services Revolving Loan	Repair of firefighting apparatus, ambulances, or rescue vehicles; Renovation, rehabilitation, or repair of facilities that house firefighting equipment, ambulances, rescue vehicles, and related equipment.	NYS DHSES	http://www.dhses.ny.gov/ofpc/services/loan/	
Environmental Protection Fund (EPF) Matching grants for the acquisition, planning, development, and improvement of parks, historic properties.		New York State Parks, Recreation & Historic Preservation (NYSOPRHP)	https://www.dec.ny.gov/about/92815.html	
Recreational Trails (RTP)	Program Matching grants for the acquisition, development, rehabilitation and maintenance of trails and trail-related projects.	NYSOPRHP	https://parks.ny.gov/grants/recreational- trails/default.aspx	
Environmental Protection & Improvement Grants	ronmental Competitive grants for environmental protection and improvement; available for municipalities, community organizations, not-for-profit		https://www.dec.ny.gov/about/92815.html	
Volunteer Fire Assistance Grants	tiretighting equipment such as portable backpack numps. Nomey		https://www.dec.ny.gov/regulations/2364.html	
Clean Water Act Section 604(b) Water Quality Planning Grants	tion 604(b) Water federal Clean Water Act. 604(b) funds are to be used for water quality		https://www.dec.ny.gov/lands/53122.html	
Water Quality Improvement Project (WQIP) Program	ent Project		https://www.dec.ny.gov/pubs/4774.html	
New York State DEC/EFC Wastewater Infrastructure Engineering Planning Grant (EPG)	New York State DEC/EFC Wastewater Infrastructure Engineering Planning		https://www.dec.ny.gov/pubs/81196.html	





Program	rogram Description		Website	
Climate Smart Communities Grant Program	The CSC Grant program was established in 2016 to provide 50/50 matching grants to cities, towns, villages, and counties (or boroughs of New York City) of the State of New York for eligible climate adaptation and mitigation projects.	NYSDEC	https://www.dec.ny.gov/energy/109181.html	
BRIDGE NY	BRIDGE NY The state is making funding available for local governments to rehabilitate and replace bridges and culverts statewide.		https://www.dot.ny.gov/BRIDGENY	





6.5 MITIGATION STRATEGY DEVELOPMENT AND UPDATE

6.5.1 Update of Municipal Mitigation Strategies

To evaluate progress on local mitigation actions, each jurisdiction was provided with a Mitigation Action Plan Review Worksheet, pre-populated with those actions identified for their jurisdiction in the prior (2017) plan. For each action, municipalities were asked to indicate the status of each action ("No Progress/Unknown," "In Progress/Not Yet Complete," "Continuous," "Completed," "Discontinued") and provide review comments on each. Municipalities were requested to quantify the extent of progress and provide reasons for the level of progress or why actions were discontinued. Each jurisdictional annex provides a table identifying their prior mitigation strategy, the status of those actions and initiatives, and their disposition within their updated strategy.

Local mitigation actions identified as "Complete" and actions identified as "Discontinued" have been removed from the updated strategies. Those local actions that municipalities identified as "No Progress/Unknown" or "In Progress/Not Yet Complete," as well as certain actions/initiatives identified as "Continuous," have been carried forward in their local updated mitigation strategies. Actions considered ongoing capabilities were marked as "Discontinued" and included in the plan as ongoing capabilities. Municipalities were asked to provide further details on these projects to help better define the projects, identify benefits and costs, and improve implementation.

At the Kick-Off and during subsequent local level planning meetings, all participating municipalities were further surveyed to identify mitigation activities completed, ongoing, and potential/proposed. As new additional potential mitigation actions, projects or initiatives became evident during the plan update process, including as part of the risk assessment update and as identified through the public and stakeholder outreach process (see Section 3 – Planning Process), communities were made aware of these either through direct communication (local meetings, email, phone) or via their draft municipal annexes.

To help support the selection of an appropriate, risk-based mitigation strategy, each annex provided a summary of hazard vulnerabilities identified during the plan update process, either directly by municipal representatives or through review of available County and local plans and reports, and through the hazard profiling and vulnerability assessment process.

Beginning in August 2022, members of the Steering Committee and contract consultants worked directly with each jurisdiction (phone, email, virtual support meetings) to assist with the development and update of their annex and include mitigation strategies, focusing on identifying well-defined, implementable projects with a careful consideration of benefits (risk reduction, losses avoided), costs, and possible funding sources (including mitigation grant programs).

Concerted efforts were made to ensure that municipalities develop updated mitigation strategies that included activities and initiatives covering the range of mitigation action types described in recent FEMA planning guidance (FEMA "Local Mitigation Planning Handbook" March 2013), specifically:

- <u>Local Plans and Regulations</u> These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- <u>Structure and Infrastructure Project</u> These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct man-made structures to reduce the impact of hazards.





- <u>Natural Systems Protection</u> These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- <u>Education and Awareness Programs</u> These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as the National Flood Insurance Program and Community Rating System, StormReady (NOAA), and Firewise (NFPA) Communities.

A mitigation strategy workshop was conducted on October 17, 2022 for all participating jurisdictions to support the development of focused problem statements based on the impacts of natural hazards in the County and their communities. These problem statements are intended to provide a detailed description of the problem area, including its impacts to the municipality/jurisdiction; past damages; loss of service; etc. An effort was made to include the street address of the property/project location, adjacent streets, water bodies, and well-known structures as well as a brief description of existing conditions (topography, terrain, hydrology) of the site. These problem statements form a bridge between the hazard risk assessment, which quantifies impacts to each community with the development of actionable mitigation strategies. Following the workshop, three annex support meetings were held for Monroe County's municipalities to assist in the development of additional actions, foster collaboration between neighboring municipalities, and steps needed to complete the municipal annexes.

A strong effort has been made to better focus local mitigation strategies to clearly defined, readily implementable projects and initiatives that meet the definition or characteristics of mitigation. Broadly defined mitigation objectives have been eliminated from the updated strategy unless accompanied by discrete actions, projects, or initiatives.

Certain continuous or ongoing strategies that represent programs that are, or since prior and existing plans have become, fully integrated into the normal operational and administrative framework of the community have been identified within the Capabilities section of each annex and removed from the updated mitigation strategy.

At least two mitigation projects per jurisdiction have been documented with an Action Worksheet, as per the New York State Hazard Mitigation Planning Standards Guide.

As discussed within the hazard profiles in Section 5.4 (Risk Assessment), the long-term effects of climate change are anticipated to exacerbate the impacts of weather-related hazards, including flood, severe storm, severe winter storm, and wildfire. By way of addressing these climate change-sensitive hazards within their local mitigation strategies and integration actions, communities are working to evaluate and recognize these long-term implications and potential impacts, and to incorporate in planning and capital improvement updates.

Municipalities included mitigation actions to address vulnerable critical facilities. These actions have been proposed in consideration of protection against 500-year events or worst-case scenarios. It is recognized, however, that in the case of projects being funded through Federal mitigation programs, the level of protection may be influenced by cost-effectiveness as determined through a formal benefit-cost analysis. In the case of "self-funded" projects, municipal discretion must be recognized. Further, it must be recognized that the County and municipalities have limited authority over privately-owned critical facility owners with regard to mitigation at any level of protection.





6.5.2 Update of County Mitigation Strategy

The update of the County-level mitigation strategies included a review of progress on the actions/initiatives identified in the 2017 HMP using a process similar to that used to review municipal mitigation strategy progress. The County, through their various department representatives, was provided with a Mitigation Action Plan Review Worksheet identifying all County-level actions and initiatives from the 2017 plan. The County reviewed each action and provided progress. For each action, relevant County representatives were asked to indicate the status of each action (*No Progress/Unknown, In Progress/Not Yet Complete, Ongoing, Completed*, or *Discontinued*), and provide review comments on each.

Projects/initiatives identified as "Complete", as well as those actions identified as Discontinued, have been removed from this plan update. Those actions the County has identified as No Progress/Unknown, In Progress/Not Yet Complete, or Ongoing have been carried forward in the County's updated mitigation strategy. Actions considered ongoing capabilities were marked as Discontinued and included in the plan as ongoing capabilities.

Throughout the course of the plan update process, additional regional and County-level mitigation actions were identified by the following processes:

- Review of the results and findings of the updated risk assessment.
- Review of available regional and County plans reports and studies.;
- Direct input from county departments and other county and regional agencies, including:
 - Monroe County Department of Environment and Planning
 - o Monroe County Department of Homeland Security and Emergency Services
 - Monroe County Department of Health
 - o Monroe County Soil and Water Conservation District
 - Monroe County Department of Public Works
 - o Monroe County Water Authority
- Input received through the public and stakeholder outreach process.

As discussed within the hazard profiles in Section 5.4 (Risk Assessment), the long-term effects of climate change are anticipated to exacerbate the impacts of weather-related hazards including drought, flood, severe storm, and severe winter storm. The County has included mitigation actions and initiatives, including continuing and long-term planning and emergency management support, to address these long-term implications and potential impacts.

Various County departments and agencies included mitigation actions to address vulnerable critical facilities. These actions were proposed in consideration of protection against 0.2-percent annual chance (500-year) events, or worst-case scenarios.

It is recognized, however, that in the case of projects being funded through federal mitigation programs, the level of protection can be influenced by cost-effectiveness, as determined through a formal benefit-cost analysis. In the case of "self-funded" projects, local government authority can affect the ability to implement. Further, the County has limited authority over privately-owned critical facility owners regarding mitigation at any level of protection.

6.5.3 Mitigation Best Practices

Catalogs of hazard mitigation best practices were developed that present a broad range of alternatives to be considered for use in Monroe County, in compliance with 44 CFR Section 201.6(c)(3)(ii). One catalog was





developed for each hazard of concern evaluated in this plan. The catalogs present alternatives that are categorized in two ways:

- By whom would have responsibility for implementation:
 - Individuals personal scale
 - Businesses corporate scale
 - o Government government scale
- By what the alternatives would do:
 - o Manipulate the hazard
 - Reduce exposure to the hazard
 - o Reduce vulnerability to the hazard
 - o Build local capacity to respond to or be prepared for the hazard

The alternatives presented include actions that will mitigate current risk from hazards and actions that will help reduce risk from changes in the impacts of these hazards resulting from climate change. Hazard mitigation actions recommended in this plan were selected from among the alternatives presented in the catalogs. The catalogs provide a baseline of mitigation alternatives that are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of the planning partners to implement. Some of these actions may not be feasible based on the selection criteria identified for this plan. The purpose of the catalogs was to provide a list of what could be considered to reduce risk from natural hazards within the planning area. Actions in the catalog that are not included for the partnership's action plan were not selected for one or more of the following reasons:

- The action is not feasible
- The action is already being implemented
- There is an apparently more cost-effective alternative
- The action does not have public or political support.

6.5.4 Mitigation Strategy Evaluation and Prioritization

Section 201.c.3.iii of 44 CFR requires how the identified mitigation strategies will be prioritized, implemented, and administered by the local jurisdictions. For this plan update, each mitigation strategy was prioritized using a modified STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) mitigation action evaluation methodology based on a set of evaluation criteria suited to the purposes of hazard mitigation strategy evaluation. This method provides a systematic approach that considers the opportunities and constraints of implementing a particular mitigation action.

The Steering Committee applied an action evaluation and prioritization methodology, which includes an expanded set of 14 criteria to include the consideration of cost-effectiveness, availability of funding, anticipated timeline, and if the action addresses multiple hazards. The 14 evaluation/prioritization criteria used in the 2023 update process are:

- 1. Life Safety How effective will the action be at protecting lives and preventing injuries?
- 2. Property Protection How significant will the action be at eliminating or reducing damage to structures and infrastructure?
- 3. Cost-Effectiveness Are the costs to implement the project or initiative commensurate with the benefits achieved?
- 4. Technical Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.





- 5. Political Is there overall public support for the mitigation action? Is there the political will to support it?
- 6. Legal Does the municipality have the authority to implement the action?
- 7. Fiscal Can the project be funded under existing program budgets (i.e., is this initiative currently budgeted for)? Or would it require a new budget authorization or funding from another source such as grants?
- 8. Environmental What are the potential environmental impacts of the action? Will it comply with environmental regulations?
- 9. Social Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
- 10. Administrative Does the jurisdiction have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
- 11. Multi-hazard Does the action reduce the risk to multiple hazards?
- 12. Timeline Can the action be completed in less than 5 years (within our planning horizon)?
- 13. Local Champion Is there a strong advocate for the action or project among the jurisdiction's staff, governing body, or committees that will support the action's implementation?
- 14. Other Local Objectives Does the action advance other local objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of other plans and programs?

Participating jurisdictions were asked to use these criteria to assist them in evaluating and prioritizing mitigation actions identified in the 2023 update. Specifically, for each mitigation action, the jurisdictions were asked to assign a numeric rank (-1, 0, or 1) for each of the 14 evaluation criteria, defined as follows:

- 1 = Highly effective or feasible
- 0 =Neutral
- -1 = Ineffective or not feasible

Further, jurisdictions were asked to provide a brief summary of the rationale behind the numeric rankings assigned, as applicable. The numerical results were totaled and then used by each jurisdiction to help prioritize the action or strategy as *low*, *medium*, or *high*. Actions that had a numerical value between 0 and 4 were categorized as *low*; actions with numerical values between 5 and 8 were categorized as *medium*; and actions with numerical values between 9 and 14 were categorized as *high*. While this provided a consistent, systematic methodology to support the evaluation and prioritization of mitigation actions, jurisdictions may have additional considerations that could influence their overall prioritization of mitigation actions.

It is noted that jurisdictions may be carrying forward mitigation actions and initiatives from prior mitigation strategies that were prioritized using a different, but not inherently contrary, approach. Mitigation actions in the prior (2017) Monroe County HMP were "qualitatively evaluated against the mitigation goals and objectives and other evaluation criteria. They were then prioritized into three categories: high, medium, and low." At their discretion, jurisdictions carrying forward prior initiatives were encouraged to re-evaluate their priority, particularly if conditions that would affect the prioritization criteria had changed.

For the plan update there has been an effort to develop more clearly defined and action-oriented mitigation strategies. These local strategies include projects and initiatives that are seen by the community as the most effective approaches to advance their local mitigation goals and objectives within their capabilities. In addition, each municipality was asked to develop problem statements. With active support from NYS DHSES planning staff, municipalities were able to develop action-oriented and achievable mitigation strategies.





As such, many of the initiatives in the updated mitigation strategy were ranked as *high* or *medium* priority, as reflective of the community's clear intent to implement them, available resources not-withstanding. In general, initiatives that would have had *low* priority rankings were appropriately screened out during the local action evaluation process.

6.5.5 Benefit/Cost Review

Section 201.6.c.3iii of 44CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. Stated otherwise, cost-effectiveness is one of the criteria that must be applied during the evaluation and prioritization of all actions comprising the overall mitigation strategy.

The benefit/cost review applied for the evaluation and prioritization of projects and initiatives in this plan update process was qualitative; that is, it does not include the level of detail required by FEMA for project grant eligibility under the Hazard Mitigation Assistance (HMA) grant programs. For all actions identified in the local strategies, jurisdictions have identified both the costs and benefits associated with project, action, or initiative.

Costs presented include the total project estimation. This can include administrative, construction (engineering, design, and permitting), and maintenance costs.

Benefits are the savings from losses avoided attributed to project implementation. These can include life safety, structure and infrastructure damages, loss of service or function, and economic and environmental damage and losses.

When possible, jurisdictions were asked to identify the actual or estimated dollar costs and associated benefits. Often numerical costs and/or benefits were not identified and may be impossible to quantify. In this case, jurisdictions were asked to evaluate project cost-effectiveness using *high*, *medium*, and *low* ratings. Where estimates of costs and benefits were available, the ratings were defined as the following:

Low < = \$10,000 Medium = \$10,000 to \$100,000 High > = \$100,000

Where quantitative estimates of costs and/or benefits were not available, qualitative ratings using the following definitions were used:

Costs			
High	Existing funding levels are not adequate to cover the costs of the proposed project, and implementation would require an increase in revenue through an alternative source (e.g., bonds, grants, and fee increases).		
Medium	The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.		
Low	The project could be funded under the existing budget. The project is part of or can be part of an existing, ongoing program.		
Benefits			
High	Project will have an immediate impact on the reduction of risk exposure to life and property.		
Medium	Project will have a long-term impact on the reduction of risk exposure to life and property or will provide an immediate reduction in the risk exposure to property.		
Low	Long-term benefits of the project are difficult to quantify in the short-term.		

Table 6-4 Qualitative Cost and Benefit Ratings

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-effective.



For some of the Monroe County initiatives identified, the Planning Partnership may seek financial assistance under FEMA's HMA programs. These programs require detailed benefit/cost analysis as part of the application process. These analyses will be performed when funding applications are prepared, using the FEMA BCA model process. The Planning Partnership is committed to implementing mitigation strategies with benefits that exceed costs. For projects not seeking financial assistance from grant programs that require this sort of analysis, the Planning Partnership reserves the right to define benefits according to parameters that meet its needs and the goals and objectives of this plan.





SECTION 7. PLAN MAINTENANCE PROCEDURES

This section details the formal process that will ensure that the Hazard Mitigation Plan (HMP) remains an active and relevant document and that the Planning Partnership maintains its eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every 5 years. In addition, this section describes how public participation will be integrated throughout the plan maintenance and implementation process. It explains how the mitigation strategies outlined in this plan update will be incorporated into existing planning mechanisms and programs, such as comprehensive land use planning processes, capital improvement planning, and building code enforcement and implementation. The plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

The plan maintenance matrix shown in Table 7-1 provides a synopsis of responsibilities for plan monitoring, integration, evaluation, and update, which are discussed in further detail in the sections below.

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Outreach to planning partners to recommend update of mitigation strategies and progress toward implementation of project and identification of new projects and to provide updated information on funding opportunities.	Each June or after the occurrence of a presidentially declared disaster	Jurisdictional points of contact identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)	Jurisdictional implementation lead identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)
Integration	In order for integration of mitigation principles action to become an organic part of the ongoing county and municipal activities, the county will incorporate the distribution of the safe growth worksheet (see 7.1.2 below) for annual review and update by all participating jurisdictions.	June each year with interim email reminders to address integration in county and municipal activities	HMP Coordinator and jurisdictional points of contact identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)	HMP Coordinator
Evaluation	Review the status of previous actions, as submitted by the monitoring task lead, and assess the effectiveness of the plan; compile and finalize update of mitigation strategy.	Updated progress report completed by September 30 of each year	Jurisdictional points of contact identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)	Alternate jurisdictional points of contact
Update	Reconvene the planning partners, at a minimum, every 5 years to guide a comprehensive update to review and revise the plan.	Every 5 years or upon major update to Comprehensive Plan or after the occurrence of a major disaster	Monroe County HMP Coordinator	Jurisdictional points of contacts identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)

Table 7-1. Plan Maintenance Matrix





7.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

The procedures for monitoring, evaluating, and updating the plan are provided below.

The HMP Coordinator is assigned to manage the maintenance and update of the plan during its performance period. The HMP Coordinator will convene the Planning Partnership and be the prime point of contact for questions regarding the plan and its implementation and will also coordinate the incorporation of additional information into the plan.

The HMP Coordinator will manage the monitoring, evaluation, and updating responsibilities identified in this section. As of the date of this plan, primary and secondary mitigation planning representatives (points of contact) are identified in each jurisdictional annex in Section 9 (Jurisdictional Annexes).

It will be the responsibility of each jurisdiction and its representatives to inform the HMP Coordinator of any changes in representation.

Currently, the Monroe County HMP Coordinator is designated as:

Timothy Henry, Office of Emergency Management Monroe County Department of Public Safety 1190 Scottsville Road, Suite 200 Rochester, NY 14624 (585) 753-3816 Email: <u>timhenry@monroecounty.gov</u>

7.1.1 Monitoring

The Planning Partnership will be responsible for monitoring progress on and evaluating the effectiveness of the plan and documenting annual progress. Each year, beginning one year after plan development, Monroe County and local Planning Partnership representatives will collect and process information from the departments, agencies, and organizations involved in implementing mitigation projects or activities identified in their jurisdictional annexes (Section 9) of this plan, by contacting persons responsible for initiating and/or overseeing the mitigation projects.

In the first year of the performance period, this will be accomplished by utilizing an online performance progress reporting system (the BAToolSM), which will enable municipal and county representatives to directly access mitigation initiatives to easily update the status of each project, document successes or obstacles to implementation, and add or delete projects to maintain mitigation project implementation. It is anticipated that all participating partners will be prompted by the tool to update progress on a quarterly basis, providing an incentive for participants to refresh their mitigation strategies and to continue implementation of projects. It is expected that this reporting system will support the submittal of an increased number of project grant fund applications due to the functionality of the system, which facilitates the sorting and prioritization of projects.

In addition to progress on the implementation of mitigation actions, including efforts to obtain outside funding and obstacles or impediments to implementation of actions, the information that Planning Partnership representatives shall be expected to document, as needed and appropriate, includes:

- Any grant applications filed on behalf of any of the participating jurisdictions
- Hazard events and losses occurring in their jurisdiction
- Additional mitigation actions believed to be appropriate and feasible
- Public and stakeholder input.





Plan monitoring for years 2 through 4 of the plan performance period will be similarly addressed via the BAToolSM or manually.

7.1.2 Integration of the HMP into Municipal Planning Mechanisms

Hazard mitigation is sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. Integrating hazard mitigation into a community's existing plans, policies, codes, and programs leads to development patterns that reduce risk from known hazards or to redevelopment that reduces risk from known hazards. The Monroe County Planning Partnership was tasked with identifying how hazard mitigation is integrated into existing planning mechanisms. Section 9 (Jurisdictional Annexes) describes how this is done for each participating municipality. During this process, many municipalities recognized the importance and benefits of incorporating hazard mitigation into future municipal planning and regulatory processes.

The Planning Partnership representatives will incorporate mitigation planning as an integral component of daily government operations. Planning Partnership representatives will work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution (Section 2 - Plan Adoption) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Partnership anticipates that:

- 1. Hazard mitigation planning will be formally recognized as an integral part of overall planning and emergency management efforts.
- 2. The HMP, Comprehensive Plans, Emergency Management Plans, and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of county residents.

During the HMP annual review process, each participating municipality will be asked to document how they are utilizing and incorporating the Monroe County HMP into their day-to-day operations and planning and regulatory processes. Each municipality will also identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and include these findings and recommendations in the Annual HMP Progress Report. The following checklist was adapted from FEMA's Local Mitigation Handbook (2013), Appendix A, Worksheet 4.2. This checklist will help a community analyze how hazard mitigation is integrated into local plans, ordinances, regulations, ordinances, and policies. By completing the checklist, it will help municipalities identify areas that currently integrate hazard mitigation and where to make improvements and reduce vulnerability to future development.

Planning Mechanisms	ou Do is? No	Notes: How is it being done or how will this be utilized in the future?
Operating, Municipal, and Capital Improvement Program Budgets	-	
• When constructing upcoming budgets, hazard mitigation actions will be funded as budget allows. Construction projects will be evaluated to see if they meet the hazard mitigation goals.		
• Annually, during adoption process, the municipality will review mitigation actions when allocating funding.		
• Do budgets limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?		

Table 7-2. Safe Growth Check List





		ou Do is?	Notes: How is it being done or how will
Planning Mechanisms	Yes	No	this be utilized in the future?
• Do infrastructure policies limit extension of existing facilities			
and services that would encourage development in areas			
vulnerable to natural hazards?			
• Do budgets provide funding for hazard mitigation projects identified in the HMP?			
Human Resource Manual			
• Do any job descriptions specifically include identifying and/or			
implementing mitigation projects/actions or other efforts to			
reduce natural hazard risk?			
Building and Zoning Ordinances			
Prior to zoning changes or development permitting, the			
municipality will review the HMP and other hazard analyses to			
ensure consistent and compatible land use.			
Does the zoning ordinance discourage development or			
redevelopment within natural areas, including wetlands,			
floodways, and floodplains?			
Does the ordinance contain natural overlay zones that set			
conditions			
• Does the ordinance require developers to take additional actions			
to mitigate natural hazard risk?			
Do rezoning procedures recognize natural hazard areas as limits			
on zoning changes that allow greater intensity or density of use?			
Does the ordinance prohibit development within or filling of			
wetlands, floodways, and floodplains?			
Subdivision Regulations		1	
Do the subdivision regulations restrict the subdivision of land			
within or adjacent to natural hazard areas?			
Do the regulations provide for conservation subdivisions or			
cluster subdivisions in order to conserve environmental			
resources?			
• Do the regulations allow density transfers where hazard areas			
exist?			
Comprehensive Plan			
Are the goals and policies of the plan related to those of the			
HMP?			
• Does the future land use map clearly identify natural hazard			
areas?			
Do the land use policies discourage development or			
redevelopment with natural hazard areas?			
Does the plan provide adequate space for expected future growth			
in areas located outside natural hazard areas?			
Land Use	1	l	
Does the future land use map clearly identify natural hazard			
• Does the future faile use map clearly identify fatural fazard areas?			
Do the land use policies discourage development or			
Do the land use policies discourage development or redevelopment with natural hazard areas?			
• Does the plan provide adequate space for expected future growth			
in areas located outside natural hazard areas?			





		ou Do is?	Notes: How is it being done or how will
Planning Mechanisms	Yes	No	this be utilized in the future?
Transportation Plan			
• Does the transportation plan limit access to hazard areas?			
• Is transportation policy used to guide growth to safe locations?			
• Are transportation systems designed to function under disaster			
conditions (e.g., evacuation)?			
Environmental Management			
• Are environmental systems that protect development from			
hazards identified and mapped?			
• Do environmental policies maintain and restore protective			
ecosystems?			
• Do environmental policies provide incentives to development			
located outside protective ecosystems?			
Grant Applications			
• Data and maps will be used as supporting documentation in			
grant applications.			
Municipal Ordinances			
• When updating municipal ordinances, hazard mitigation will be			
a priority			
Economic Development			
Local economic development group will take into account			
information regarding identified hazard areas when assisting			
new businesses in finding a location.			
Public Education and Outreach	-		
• Does the municipality have any public outreach mechanisms/			
programs in place to inform citizens on natural hazards, risk, and			
ways to protect themselves during such events?			

7.1.3 Evaluating

Evaluation of the mitigation plan is an assessment of whether the planning process and actions have been effective, if the HMP goals are being achieved, and whether changes are needed. The HMP Coordinator will consult with the Planning Partnership members to evaluate the effectiveness of the plan implementation and to reflect changes that could affect mitigation priorities or available funding.

The status of the HMP will be discussed and documented at an annual plan review meeting of the Planning Partnership to be held either in person or via teleconference approximately 1 year from the date of local adoption of this update and successively thereafter. At least 2 weeks before the annual plan review meeting, the Monroe County HMP Coordinator will advise Planning Partnership members of the meeting date, agenda, and expectations of the members.

The Monroe County HMP Coordinator will be responsible for calling participants and coordinating the annual plan review meeting and soliciting input regarding progress toward meeting plan goals and objectives. These evaluations will assess whether:

- Goals and objectives address current and expected conditions
- The nature or magnitude of the risks has changed
- Current resources are appropriate for implementing the HMP and if different or additional resources are now available





- Actions were cost effective
- Schedules and budgets are feasible
- Implementation problems are present, such as technical, political, legal, or coordination issues with other agencies
- Outcomes have occurred as expected
- Changes in county, city, town, or village resources impacted plan implementation (e.g., funding, personnel, and equipment)
- New agencies/departments/staff are included, involving other local governments as defined under 44 CFR 201.6.

Specifically, the Planning Partnership will review the mitigation goals, objectives, and activities using performance-based indicators, including:

- New agencies/departments
- Project completion
- Underspending/overspending
- Achievement of the goals and objectives
- Resource allocation
- Timeframes
- Budgets
- Lead/support agency commitment
- Resources
- Feasibility

Finally, the Planning Partnership will evaluate how other programs and policies have conflicted or augmented planned or implemented measures and will identify policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions ("Implementation of Mitigation Plan through Existing Programs" subsection later in this section discusses this process). Other programs and policies can include those that address:

- Economic development
- Environmental preservation
- Historic preservation
- Redevelopment
- Health and/or safety
- Recreation
- Land use/zoning
- Public education and outreach
- Transportation

The Planning Partnership should refer to the evaluation forms, Worksheets #2 and #4 in the FEMA 386-4 guidance document, to assist in the evaluation process (see Appendix G – Plan Review Tools). Further, the Planning Partnership should refer to any process and plan review deliverables developed by the county or participating jurisdictions as a part of the plan review processes established for prior or existing local HMPs within the county.

The Monroe County HMP Coordinator will be responsible for preparing an Annual HMP Progress Report for each year of the performance period, based on the information provided by the Planning Partnership and



municipal points of contact, and other information as appropriate and relevant. These annual reports will provide data for the 5-year update of this HMP and will assist in pinpointing any implementation challenges. By monitoring the implementation of the HMP, the Planning Partnership will be able to assess which projects are completed, which are no longer feasible, and which projects should require additional funding.

Following any major disasters, the HMP will be evaluated and revised to determine if the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damage or if data listed in the Section 5.4 (Hazard Profiles) of this plan has been collected to facilitate the risk assessment. This is an opportunity to increase the community's disaster resistance and build a better and stronger community.

7.1.4 Updating

44 CFR 201.6.d.3 requires that local hazard mitigation plans be reviewed, revised as appropriate, and resubmitted for approval to remain eligible for benefits awarded under DMA 2000. It is the intent of the Monroe County HMP Planning Partnership to update this plan on a 5-year cycle from the date of initial plan adoption.

To facilitate the update process, the Monroe County HMP Coordinator, with support of the Planning Partnership, will use the second annual Planning Partnership meeting to develop and commence the implementation of a detailed plan update program. Prior to the 5-year update, the Monroe County HMP Coordinator will invite representatives from the New York State Division of Homeland Security and Emergency Services (NYS DHSES) to provide guidance on plan update procedures. At a minimum, this will establish who will be responsible for managing and completing the plan update effort, items that need to be included in the updated plan, and a detailed timeline with milestones to ensure that the update is completed according to regulatory requirements.

At this meeting, the project team will determine what resources will be needed to complete the update and seek to secure these resources.

Following each 5-year update of the HMP, the updated plan will be distributed for public comment. After all comments are addressed, the HMP will be revised and distributed to all planning partners.

7.1.5 Grant Monitoring and Coordination

Monroe County intends to be a resource to the Planning Partnership in the support of project grant writing and development. The degree of this support will depend on the level of assistance requested by the partnership during openings for grant applications. As part of grant monitoring and coordination, Monroe County intends to provide the following:

- Notification to planning partners about impending grant opportunities
- A current list of eligible, jurisdiction-specific projects for funding pursuit consideration
- Notification about mitigation priorities for the fiscal year to assist the planning partners in the selection of appropriate projects.

7.2 IMPLEMENTATION OF MITIGATION PLAN THROUGH EXISTING PROGRAMS

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the County, there are many existing plans and programs that support hazard risk management, and thus it is critical that this HMP integrate and coordinate with and complement those existing plans and programs.



The Capability Assessment section of Section 6 (Mitigation Strategy) provides a summary and description of the existing plans, programs, and regulatory mechanisms at all levels of government (federal, state, county, and local) that support hazard mitigation within the County. Within each jurisdictional annex in Section 9 (Jurisdictional Annexes), the county and each participating jurisdiction identified how they have integrated hazard risk management into their existing planning, regulatory, and operational/administrative framework ("existing integration") and how they intend to promote this integration ("opportunities for future integration").

It is the intention of Planning Partnership representatives to incorporate mitigation planning as an integral component of daily government operations. Planning Partnership representatives will work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution (Section 2 - Plan Adoption) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Partnership anticipates that:

- 1) Hazard mitigation planning will be formally recognized as an integral part of overall emergency management efforts.
- 2) The HMP, Comprehensive Plans, Emergency Management Plans and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of county residents.

Other planning processes and programs to be coordinated with the recommendations of the HMP include the following:

- Emergency response plans
- Training and exercise of emergency response plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community wildfire protection plans
- Comprehensive flood hazard management plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/improved public participation
- Educational programs
- Continued interagency coordination

During the annual plan evaluation process, the HMP Coordinator and Planning Partnership will strive to identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and include these findings and recommendations in the Annual HMP Progress Reporting.





7.3 CONTINUED PUBLIC INVOLVEMENT

Monroe County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This HMP update will continue to be posted online at the following link: <u>https://www.monroecountynyhmp.com/</u>. In addition, public outreach and dissemination of the HMP will include:

- Links to the plan on municipal websites of each jurisdiction with capability
- Continued utilization of existing social media outlets (Facebook, Twitter) to inform the public of natural hazard events, such as floods and severe storms; the public can be educated via the jurisdictional websites on how these applications can be used in an emergency situation
- Promotion of articles or workshops on hazards to educate the public and keep them aware of the dangers of hazards

The Monroe County HMP Coordinator will be responsible for receiving, tracking, and filing public comments regarding this HMP. The public will have an opportunity to comment on the plan via the hazard mitigation website at any time. The Monroe County HMP Coordinator will ensure that:

- Public and stakeholder comments and input on the plan, and hazard mitigation in general, are collected, recorded, and addressed as appropriate.
- The Monroe County HMP website is maintained and updated as appropriate.
- Copies of the latest approved plan are available for review at appropriate county facilities, along with instructions to facilitate public input and comment on the plan.
- Public notices, including media releases, are made (as appropriate) to inform the public of the availability of the plan, particularly during plan update cycles.





ACRONYMS AND ABBREVIATIONS

%	Percent
ACS	American Community Survey
ADA	American Disabilities Act
ARC	American Red Cross
BCA	Benefit Cost Analysis
BRIC	Building Resilient Infrastructure and Communities Program
CAC	Community Advisory Committee
CAP	Climate Action Plan
CATP	Countywide Active Transportation Plan
CAV	Community Assistance Visit
CDBG	Community Development Block Grant
CDBG-DR	Community Development Block Grant Disaster Recovery
CDC	Centers for Disease Control and Prevention
CEHA	Coastal Erosion Hazard Areas
CEMP	Comprehensive Emergency Management Plan
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Index System
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEO	Chief Executive Officer
CFM	Certified Floodplain Manager
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CDC	Centers for Disease Control and Prevention
CRRA	Community Risk and Resiliency Act
CRREL	Cold Regions Research and Engineering Laboratory
CRS	Community Rating System
CSC	Climate Smart Communities (NYSDEC)
DCEA	Division of Code Enforcement and Administration
DCNR	Department of Conservation and Natural Resources
DEM	Digital Elevation Model
DES	Department of Environmental Services
DHS	Department of Homeland Security
DHSES	Division of Homeland Security and Emergency Services
DFIRM	Digital Flood Insurance Rate Map





DMA 2000	Disaster Mitigation Act of 2000
DMNA	Dudgeon-Monroe Neighborhood Association
DOT	Department of Transportation
DPW	Department of Public Works
DPH	Department of Public Health
DR	Major Disaster Declaration (FEMA)
DV	Domestic Violence
EAB	Emerald Ash Borer
EAP	Emergency Action Plan
ECWA	Erie County Water Authority
ECD	Emergency Communications Department
EF	Enhanced Fujita Scale
EFC	New York State Environmental Facilities Corporation
EM	Emergency Declaration (FEMA)
EM	Emergency Management
EMPG	Emergency Management Performance Grants Program
EMS	Emergency Medical Services
EOC	Emergency Operation Center
EOP	Emergency Operation Plan
EPA	Environmental Protection Agency
EPF	Environmental Protection Fund
EPOD	Environmental Projection Overlay District
EST	Eastern
EPZ	Emergency Planning Zone
EWP	Emergency Watershed Protection Program
FD	Fire Department
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FIA	Flood Insurance Administration
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FPA	Floodplain Administrator
FPM	Floodplain Manager
FPE	Floodplain Easement
GHG	Greenhouse Gas



GIS	Geographic Information System
HAZUS	Hazards U.S.
HAZMAT	Hazardous Materials
HEC	Hydrologic Engineering Centers
HHPD	Rehabilitation of High Hazard Potential Dams grant program
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HOC	Hazard of Concern
HSGP	Homeland Security Grant Program
HTFC	Housing Trust Fund Corporation
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
HWA	Hemlock Wooly Adelgid
IA	Individual Assistance
IPCC	International Panel on Climate Change
ISO	Insurance Service Organization
IT	Information Technology
IDF	Intensity Duration Frequency
LAL	Lakeville Railroad Corporation
LCSN	Lamon-Doherty Cooperative Seismographic Network
LDD	Limited Development Districts
LOIP	Letter of Intent to Participate
LOMR	Letter of Map Revision
LWRP	Local Waterfront Revitalization Program
LOWPA	Lake Ontario Watershed Protection Alliance
LIDAR	Laser Imaging Detection and Ranging
MCHMP	Monroe County Hazard Mitigation Plan
MCDOT	Monroe County Department of Transportation
MC	Monroe County
MCDPD	Monroe County Department of Planning and Development
MCDPH	Monroe County Department of Public Health
MCWA	Monroe County Water Authority
MCSWCD	Monroe County Soil & Water Conservation District
MGD	Million Gallons per Day
MMI	Modified Mercalli Intensity Scale



MOSF	Ministry of Strategy and Finance
MRP	Mean Return Period
N/A	Not Applicable
NA	Not Available
NASA	National Aeronautics and Space Administration
NCEI	National Centers for Environmental Information
NDMC	National Drought Mitigation Center
NEHRP	National Earthquake Hazard Reductions Program
NFIP	National Flood Insurance Program
NPL	National Priority List
NIDIS	National Integrated Drought Information System
NIMS	National Incident Management System
NJAFM	New Jersey Association of Floodplain Managers
NOAA	National Oceanic and Atmospheric Administration
NJOEM	New Jersey Office of Emergency Management
NPDP	National Performance of Dams Program
NRCC	Northeast Regional Climate Center
NRCS	Natural Resources Conservation Service
NSSL	National Severe Storms Library
NWS	National Weather Service
NY	New York
NYC	New York City
NYCEM	New York City Area Consortium for Earthquake Loss Mitigation
NYCDEP	New York City Department of Environmental Protection
NYC OEM	New York City Office of Emergency Management
NYCRR	New York Codes, Rule, and Regulations
NYS	New York State
NYS DHSES	New York State Division of Homeland Security and Emergency Services
NYS DEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
NYS GIS	New York State Geographic Information System
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYCDEP	New York City Department of Environmental Protection



NYSERDA	New York State Energy Research and Development Authority
NYSHMP	New York State Hazard Mitigation Plan
NYSOEM	New York State Office of Emergency Management
OEM	Office of Emergency Management
PA	Public Assistance
PESA	Phase Environmental Site Assessment
PDSI	Palmer Drought Severity Index
PDF	Portable Document Format
PBS	Petroleum Bulk Storage
PCDA	Property Condition Disclosure Act
PDM	Pre-Disaster Mitigation Program
PGA	Peak Ground Acceleration
PRISM	Parameter Elevation Relationships on Independent Slopes Model
PPE	Personal Protective Equipment
Pop.	Population
PW	Public Works
RAS	Rivers Analysis System
REC	Rochester Environmental Commission
RCV	Replacement Cost Value
RCPP	Regional Conservation Partnership Program
RL	Repetitive Loss
RSI	Regional Snowfall Index
RTE	Route
RG&E	Rochester Gas and Electric Corporation
RTS	Regional Transit Service
RGRTA	Rochester Genesee Regional Transportation Authority
RS	Received Standard
RSR	Rochester and Southern Railroad
SARS	Severe Acute Respiratory Syndrome
SSBG	Social Services Block Grant Program
SBA	Small Business Administration
SC	Steering Committee
SEQRA	State Environmental Quality Review Act
SFHA	Special Flood Hazard Area
SHSP	State Homeland Security Program
SFMRG	State Flood Risk Management Guidance



SGIA	Smart-Growth Implementation Assistance
SPDES	State Pollutant Discharge Elimination System
SILVIS	
SRL	Severe Repetitive Loss
SR	State Route
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, Environmental
SUNY	State University of New York
SWCD	Soil and Water Conservation District
SWMP	Storm Water Management Plan
TBD	To Be Determined
TORRO	The Tornado and Storm Research Organization
TV	Television
USACE	U.S. Army Corps of Engineers
USEDA	U.S. Economic Development Administration
US	United States
USD	U.S. Dollar
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEDA	U.S. Economic Development Administration
USEPA	U.S. Environmental Protection Agency
USFA	U.S. Fire Administration
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
VA	Vulnerability Assessment
VB	Village Board
WCT	Wind Chill Temperature
WHO	World Health Organization
WNV	West Nile Virus
WQIP	Water Quality Improvement Project
WRRF	Water Resource Recovery Facility
WUI	Wildland Urban Interface
WWTW	Wastewater Treatment Facilities
ZBA	Zoning Board Association





References

Section 4 – County Profile

Cornell University. 2018. "Cornell PAD Projections 2018." Online address: https://pad.human.cornell.edu/counties/projections.cfm

2020 MCMLU Report FINAL.pdf (monroecounty.gov)

Section 5.4.1 – Disease Outbreak

Center for Disease Control and Prevention (CDC). 2021. COVID-19. Accessed 2021. https://www.cdc.gov/coronavirus/2019-ncov/.

Center for Disease Control and Prevention (CDC). 2021. Lyme Disease. August. Accessed 2021. https://www.cdc.gov/lyme/.

- Center for Disease Control and Prevention (CDC). 2021. West Nile Virus. https://www.cdc.gov/westnile/index.html.
- 2022. "West Nile Virus." *Center for Disease Control and Prevention*. June 02. Accessed August 20, 2022. https://www.cdc.gov/westnile/index.html.
- Center for Disease Control and Prevention (CDC). 2013. *West Nile Virus in the United States*. June 14. Accessed 2021. https://www.cdc.gov/westnile/resources/pdfs/wnvguidelines.pdf.
- Center for Disease Control and Prevention (CDC). 2020. *Pandemic Influenza*. May 12. https://www.cdc.gov/flu/pandemic-resources/index.htm.
- Finger Lakes Regional Economic Development Council. 2020. 2020 Economic Recovery Strategy: Finger

 Lakes.
 https://regionalcouncils.ny.gov/sites/default/files/2021

 05/Finger%20Lakes%20Recovery%20Strategy%20Document%202020_4.pdf,
 Rochester

 Metropolitan Statistical Area: Finger Lakes Regional Economic Development Council.
 Rochester
- Geographic Information Systems (GIS), Westchester County. 2021. Westchester County COVID-19Dashboard.October30.Accessed2021.https://wcgis.maps.arcgis.com/apps/dashboards/280339d96db14efd9cc304dba0f3a71d.
- Natural Resource Defense Council. 2015. "Climate Changes Threatens Health." *Natural Defense Council*. October 13. Accessed August 29, 2022. https://www.nrdc.org/resources/climate-change-threatens-health.
- New York Department of Environmental Conservation. 2020. *Pesticie Laws and Regulations*. Accessed 2020. https://www.dec.ny.gov/chemical/112881.html#:~:text=Pesticide%20Laws%20and%20Regulations,in %20the%20Environmental%20Conservation%20Law.&text=Businesses%20must%20be%20registere d%20with,services%20in%20New%20York%20State.



Monroe County Department of Planning and Development. 2016. "2016 Monroe County Agricultural Districts." Online address: <u>https://www.monroecounty.gov/files/planning/Agriculture/2016WesternReviewCountyReportMap_12-7.pdf</u>



- New York State Department of Health. 2019. "Lyme Disease and Other Diseases Carried by Ticks." *New York State Department of Health.* March. https://www.health.ny.gov/diseases/communicable/lyme/.
- New York State Department of Health. 2021. *What You Should Know About the Flu*. October. Accessed 2021. https://www.health.ny.gov/diseases/communicable/influenza/seasonal/.
- New York Times. 2022. *Tracking Coronavirus in Monroe County, N.Y.: Latest Map and Case Count.* August 30. https://www.nytimes.com/interactive/2021/us/monroe-new-york-covid-cases.html.
- New Jersey Office of Emergency Management (NJOEM). 2019. "New Jersey Office of Emergency Management." *State of New Jersey 2019 Hazard Mitigation Plan.* Accessed 2019. https://nj.gov/njoem/mitigation/2019-mitigation-plan.shtml.
- New York City (NYC) Emergency Management. 2019. NYC Hazard Mitigation. Accessed 2021. https://nychazardmitigation.com/.
- New York State Deartment of Health (NYS DOH). 2019. *Lyme Disease and Other Diseases Carried by Ticks*. March. Accessed 2021. https://www.health.ny.gov/diseases/communicable/lyme/.
- NYS Health Connector. 2022. *NYS Health Connector*. August 18. https://nyshc.health.ny.gov/web/nyapd/newyork-state-flu-tracker.
- New York State Deartment of Health (NYS DOH). 2019. "New York State Department of Health (NYSDOH) Statewide Mosquito-Borne Disease Activity Report." *New York State Department of Health*. October 31.

https://www.health.ny.gov/diseases/west_nile_virus/docs/weekly_arboviral_surveillance_report.pdf.

- New York State Deartment of Health (NYS DOH). 2017. West Nile Virus (WNV). August. https://www.health.ny.gov/diseases/west_nile_virus/fact_sheet.htm.
- New York State Deartment of Health (NYS DOH). 2017. *West Nile Virus (WNV) Disease*. August. Accessed 2021. https://www.health.ny.gov/diseases/west_nile_virus/index_wnv.htm.
- New York State Dpeartment of Health (NYSDOH). 2021. "NYS Health Connector ." *New York State Department of Health.* Accessed 2021. https://nyshc.health.ny.gov/web/nyapd/new-york-state-flu-tracker.
- New York State Energy Research and Development Authority (NYSERDA). 2011/2014. *ClimAID Updating the* 2011 *ClimAID Climate Risk Information.* Albany: NYS. https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- Placer Mosquito and Vector Control District. 2019. *Invasive Species*. Accessed 2019. http://www.placermosquito.org/unlisted-news/invasivespecies/.
- Steere, Allen, Jenifer Coburn, and Lisa Glickstein. 2004. "The emergence of Lyme disease." *The Journal of Clinical Investigation* 1093-1011.
- TickCheck. 2022. *TickCheck*. Accessed August 20, 2022. https://www.tickcheck.com/stats/county/newyork/monroe-county/lyme.





- Towers, S., G. Chowell, R Hameed, M Jastrebski, M Khan, J Meeks, A Mubayi, and G Harris. 2013. "Climate Change and Influenza: the likelihood of early and severe influenza seasons following warmer than average winters." *National Library of Medicine*.
- USA Facts. 2022. "Monroe County, New York coronavirus cases and deaths." USA Facts. August 19. https://usafacts.org/visualizations/coronavirus-covid-19-spread-map/state/new-york/county/monroecounty.
- World Health Organization (WHO). 2009. "The WHO Pandemic Phases." *World Health Organization*. Accessed 2022. https://www.ncbi.nlm.nih.gov/books/NBK143061/.
- World Health Organization. 2022. Coronavirus Disease (COVID-19). https://www.who.int/health-topics/coronavirus#tab=tab_1.
- World Health Organization. 2009. Pandemic Influenza Preparedness and Response. Geneva: World Health Organization.

Section 5.4.2 - Drought

- Centers for Disease Control and Prevention (CDC). 2012. "Drought and Health." *Center for Disease Control and Prevention (CDC)*. July 30. http://www.cdc.gov/nceh/drought/.
- Cornell University. 2017. "2017 County and Economic Development Regions Population Estimates." CornellProgramonAppliedDemographics.https://pad.human.cornell.edu/papers/downloads/Vintage%202017%20report.pdf.
- Environmental Protection Agency (EPA). 2013. "Climate Change: Northeast Impacts & Adaptation." June 21. http://www.epa.gov/climatechange/impacts-adaptation/northeast.html.
- National Integrated Drought Information System. 2020. ""Fire"." https://www.drought.gov/drought/data-maps-tools/fire.
- National Drought Mitigation Center (NDMC). 2013. "Drought Severity Classification." National Drought Mitigation Center. http://www.unc.edu/~rowlett/units/scales/drought.html.
- New York State Energy Research and Development Authority (NYSERDA). n.d. "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for the Effective Climate Change Adaptation in New York State." https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- National Integrated Drought Information System (NIDIS). 2015. "Palmer Drought Severity Index." *National Integrated Drought Information System (NIDIS)*. http://www.drought.gov/drought/content/products-current-drought-and-monitoring-drought-indicators/palmer-drought-severity-index.
- National Oceanic and Atmospheric Administration (NOAA). 2000. *All Dried Up.* Accessed 2016. http://coastwatch.noaa.gov/cwn/images/Drought_Module.pdf.
- National Oceanic and Atmospheric Administration (NOAA). 2022. "Drought: A media resource guide." June10.Accessed2022.https://www.noaa.gov/media-advisory/drought-media-resource-





guide#:~:text=Droughts%20pose%20significant%20danger%20to,eggs%2C%20youth%20and%20ad ult%20fish.

- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. https://mitigateny.availabs.org/hazards/drought.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2011. "2011 State Standard Multi-Hazard Mitigation Plan." http://www.dhses.ny.gov/oem/mitigation/archive/hm-plan-2011.cfm.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2014. "2014 New York State Standard Multi-Hazard Mitigation Plan." http://www.dhses.ny.gov/oem/mitigation/plan.cfm.
- New York State Department of Environmental Conservation (NYSDEC). n.d. "Current Drought Conditions." Accessed 2022. https://www.dec.ny.gov/lands/5017.html.
- New York State Department of Environmental Conservation (NYSDEC). n.d. "Drought." Accessed 2022. https://www.dec.ny.gov/lands/5011.html.
- New York State Department of Environmental Conservation (NYSDEC). 2022. "New York State Drought Regions ." http://www.dec.ny.gov/lands/5014.html.
- New York State Energy Research and Development Authority (NYSERDA). 2014. "2014 Supplement Updated Climate Projections Report." http://www.nyserda.ny.gov/climaid.
- New York State Energy Research and Development Authority (NYSERDA). 2011. "Responding to Climate Change in New York." http://www.nyserda.ny.gov/climaid.
- New York State Energy Research and Development Authority (NYSERDA). 2014. "Responding to Climate Change in New York State." https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- New York State Energy Research and Development Authority (NYSERDA). 2011. "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for the Effective Climate Change Adaptation in New York State." https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%2 %20to%20Climate%20Change%20in%20New%20York.
- Rochester First. 2022. https://www.rochesterfirst.com/monroe-county/new-york-dec-issues-drought-watch-in-21-counties/ .
- U.S. Department of Agriculture (USDA). 2017. "2017 Census of Agriculture Monroe County Profile." Accessed September 2022. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/New_York/cp36055.pdf.





- U.S. Department of Agriculture (USDA). 2017. "2017 Census of Agriculture for Monroe County, New York." https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/New_Yo rk/cp36055.pdf.
- U.S. Department of Agriculture (USDA). 2022. "Cause of Loss Historical Data Files." <u>http://www.rma.usda.gov/data/cause.html</u>.

Section 5.4.3 - Earthquake

- Brown, W. 2001. *Hazard Maps Help Save Lives and Property*. USGS. http://pubs.usgs.gov/fs/1996/fs183-96/fs183-96.pdf.
- Federal Emergency Management Agency (FEMA). 2022. "Disaster Information." https://www.fema.gov/disaster.
- Ready.gov. 2013. *Earthquakes*. http://www.ready.gov/earthquakes.
- Federal Emergency Management Agency (FEMA). 2001. Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA.
- Lamon-Doherty Cooperative Seismographic Network (LCSN). 2014. "LCSN Stations." http://www.ldeo.columbia.edu/LCSN/Station/station.php.
- National Aeronautics and Space Administration (NASA). 2004. Retreating Glaciers Spur Alaskan Earthquakes. NASA. http://www.nasa.gov/centers/goddard/news/topstory/2004/0715glacierquakes.html.
- New York State Museum. 2012. "GIS Database. NYS." http://www.nysm.nysed.gov/gis/.
- New Jersey Office of Emergency Management (NJOEM). 2013. New Jersey Hazard Mitigation Plan. http://www.state.nj.us/njoem/programs/mitigation_plan2012.html, NJOEM.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2011. "2011 State Standard Multi-Hazard Mitigation Plan." http://www.dhses.ny.gov/oem/mitigation/archive/hm-plan-2011.cfm.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2014. "2014 New York State Standard Multi-Hazard Mitigation Plan." http://www.dhses.ny.gov/oem/mitigation/plan.cfm.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. "Mitigate NY." https://mitigateny.availabs.org/.
- Pennsylvania Department of Concervation and Natural Resources (PA DCNR). 2007. "Earthquake Hazard in Pennsylvania." https://www.google.com/url?client=internal-elementcse&cx=016351591786576881989:rc4cp9drohe&q=http://elibrary.dcnr.pa.gov/PDFProvider.ashx%3 Faction%3DPDFStream%26docID%3D1752494%26chksum%3D%26revision%3D0%26docName% 3DES10_EQHazard_Pa%26nativeExt%3Dpdf%26P.

Shedlock, K. M., and L. C. Pakiser. 1997. "Earthquakes." USGS. http://pubs.usgs.gov/gip/earthq1/.





- Tantala, M. 2003. "Earthquake Risk and Mitigation in New York, New Jersey, and Connecticut Region. New York: NYCOEM." http://nycem.org/techdocs/FinalReport/03-SP02p.pdf.
- Tantala, M. et al. 2003a. *TantThe New York City Consortium for Earthquake Loss Mitigation (NYCEM) Earthquake Risks and Mitigation in New York, New Jersey, and Connecticut Region.* Accessed 2021. http://nycem.org/techdocs/FinalReport/03-SP02p.pdf.
- U.S. Census. 2020. "American Community Survey 5-year Estimates 2020."
- U.S. Geologic Survey (USGS). 2018. "2018 Long Term Seismic Hazard Map." USGS. Accessed 2022. https://www.usgs.gov/media/images/2018-long-term-national-seismic-hazard-map.
- U.S. Geologic Survey (USGS). 2020. "At what magnitude does damage begin to occur in an earthquake." https://www.usgs.gov/faqs/what-magnitude-does-damage-begin-occur-earthquake?qtnews_science_products=0#qt-news_science_products.
- U.S. Geologic Survey (USGS). 2012. "Earthquake Glossary." USGS. http://earthquake.usgs.gov/learn/glossary/.
- U.S. Geologic Survey (USGS). 2020. "Ground Failure." https://earthquake.usgs.gov/data/ground-failure/.
- U.S. Geologic Survey (USGS). 2022. "Latest Earthquakes Did you feel it?" USGS. Accessed 2022. https://earthquake.usgs.gov/earthquakes/map/?extent=46.79318,-81.74998&extent=46.80147,-81.72571&range=search&format=dyfi&listOnlyShown=true&timeZone=utc&search=%7B%22name %22:%22Search%20Results%22,%22params%22:%7B%22starttime%22:%222015-01-01%2000:00:00%.
- U.S. Geologic Survey (USGS). n.d. "What are the effects of earthquakes." https://www.usgs.gov/naturalhazards/earthquake-hazards/science/what-are-effects-earthquakes?qt-science_center_objects=0#qtscience center objects.
- Volkert, R., and R. Witte. 2015. "Geological History and Virtual Field Trip of the New Jersey Highlands." *New Jersey Geological Survey.* Accessed 2022. <u>http://www.state.nj.us/dep/njgs/enviroed/freedwn/HighlandsVFT.pdf.</u>

Section 5.4.4 – Extreme Temperature

- Center for Disease Control and Prevention [CDC]. 2012. "Natural Disasters and Severe Weather." *Center for Disease Control and Protection*. December 03. Accessed August 22, 2022. https://www.cdc.gov/disasters/winter/guide.html.
- Cornell University. 2018. "County Projection Explorer." *Cornell Program on Applied Demographics*. Accessed August 24, 2022. https://pad.human.cornell.edu/counties/projections.cfm.
- Weather.com. n.d. *The Climate of New York*. Accessed August 30, 2022. http://www.weather.com/weather/wxclimatology/monthly/USNY0378.
- U.S. Environmental Protection Agency [EPA]. 2022. *Heat Island Effect*. June 6. Accessed August 30, 2022. https://www.epa.gov/heat-islands.





- National Weather Service. n.d. Cold Weather Safety. Accessed August 22, 2022. https://www.weather.gov/safety/cold.
- National Oceanic and Atmospheric Administration (NOAA). 2012. "Location of US Climate Divisions." *Earth System Research Laboratory. Physical Sciences Laboratory.* Accessed 2022. http://www.esrl.noaa.gov/psd/data/usclimdivs/data/map.html.
- National Weather Service. 2009. *National Weather Service, Heat Wave*. June 25. Accessed August 30, 2022. https://w1.weather.gov/glossary/index.php?word=heat+wave.
- National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI). 2020. U.S Climate Normals Quick Access. Accessed August 30, 2022. https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-monthly&timeframe=30&location=NY&station=USW00014768.
- National Weather Service (NWS). 2021. "Weather Related Fatality and Injury Statistics." *National Weather Service*. Accessed August 23, 2022. https://www.weather.gov/hazstat/.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. "Hazards." *MitigateNY*. Accessed August 23, 2022. https://mitigateny.availabs.org/hazards/heatwave.
- New York State Division of Homeland Security and Emergency Services (NYSDHSES). n.d. "Heat Safety Tips." *NYSDHSES*. Accessed August 23, 2022. https://www.dhses.ny.gov/heat-safety-tips.
- New York State Energy Research and Development Authority (NYSERDA). 2014. "Responding to Climate Change in New York State (ClimAID)." *NYSERDA*. September. Accessed August 23, 2022. https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%20Technical%20Response %20to%20Climate%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- U.S. Census Bureau. 2020. "U.S. Census Bureau." *Monroe County, New York*. Accessed August 2022, 2022. https://data.census.gov/cedsci/table?g=0500000US36055&tid=DECENNIALPL2020.P1.
- U.S. Department of Agriculture (USDA). 2017. "2017 Census of Agriculture for Monroe County, New York." https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/New_Yo rk/cp36055.pdf.
- U.S. Geologic Survey (USGS). 2020. Drought, FIre and Extreme Weather. https://www.usgs.gov/ecosystems/climate-adaptation-science-centers/science/drought-fire-andextreme-weather.

Section 5.4.5 - Flood

American Community Survey. 2020. American Community Survey 5-year Estimates 2020.

Centers for Disease Control and Prevention (CDC). 2019. Mold. https://www.cdc.gov/mold/default.htm.

Centers for Disease Control and Prevention (CDC). 2018. SVI Interactive Map. Accessed 2022. https://svi.cdc.gov/map.html.





- Center for Disaster Resilience. 2016. *The Growing Threat of Urban FLooding: A National Challenge*. https://cdr.umd.edu/sites/cdr.umd.edu/files/resource_documents/COMPRESSEDurban-flooding-report-online-compressed-0319.pdf.
- Federal Emergency Management Agency (FEMA). 2011. Coastal Construction Manual. http://www.fema.gov/media-library/assets/documents/3293?id=1671.
- Federal Emergency Management Agency (FEMA). 2003. *FEMA Flood Insurance Tutorial*. https://www.fema.gov/media-library-data/20130726-1550-20490-1795/ot_fis.pdf.
- Federal Emergency Management Agency (FEMA). 1997. FEMA's Multi-Hazard Identification and Risk Assessment (MHIRA). http://www.fema.gov/library/viewRecord.do?id=2214.
- Federal Emergency Management Agency (FEMA). 2008. Flood Insurance Study Monroe County, New York. https://map1.msc.fema.gov/data/36/S/PDF/36055CV001A.pdf?LOC=fdad83c0b7a00f80c0de4429397 2aa06.
- Federal Emergency Management Agency (FEMA). 2020. *Flood Zones*. https://www.fema.gov/glossary/flood-zones.
- Federal Emergency Management Agency (FEMA). 2007. Floodplain Management Principles and Current Practices. https://training.fema.gov/hiedu/aemrc/courses/coursetreat/fm.aspx.
- Federal Emergency Management Agency (FEMA). 2022. "Preliminary Flood Insurance Study Monroe County, New York."
- Harris, T. 2008. How Floods Work. http://science.howstuffworks.com/flood.htm.
- Illinois Association for Floodplain and Stormwater Management. 2006. Section 1 Natural Aspects of Flooding: Part l Flooding and Floodplain Management. http://www.illinoisfloods.org/documents/home_study_course/1%20Natural%20Aspects%20of%20Fl ooding.pdf.'.
- National Weather Service. 2009. Flash Flood. http://w1.weather.gov/glossary/index.php?word=flash+flood.
- New Jersey Association of Floodplain Managers (NJAFM). 2015. *Floodplain Management in New Jersey Quick Guide*. https://njafm.wildapricot.org/resources/Documents/KeyDocs/NJQuickGuide_web.pdf.
- NationalWeatherService(NWS).2011.FloodSafety.http://www.erh.noaa.gov/car/WCM/Awareness_Campaigns_files/flood_part_1.htm.Safety.Safety.Safety.
- New York City Area Consortium for Earthquake Loss Mitigation (NYCEM). 2019. New York City Hazard Mitigation Plan. https://nychazardmitigation.com/.
- New York State Department of Environmental Conservation (NYS DEC). n.d. *CEHA Communities*. Accessed 2022. https://www.dec.ny.gov/lands/86552.html.
- New York State Department of Environmental Conservation (NYS DEC). n.d. *General Permit for Great Lakes Erosion Control*. Accessed 2022. https://www.dec.ny.gov/permits/120369.html.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. Section 3.9 *Flood.* https://mitigateny.availabs.org/hazards/riverine.





- New York State Department of Environmental Conservation (NYSDEC). 2009. *Guidance for Dam Hazard Classification*. http://www.dec.ny.gov/docs/water_pdf/togs315.pdf.
- New York State Energy Research and Development Authority (NYSERDA). 2014. Responding to Climate Change in New York State.

 https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- New York State Energy Research and Development Authority (NYSERDA). 2011. Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation in New York State. https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Environmental/EMEP/climaid/ClimAID-Report.pdf.
- Rokaya, P. 2018. *Trends in the Timing and Magnitude of Ice-Jam Floods in Canada*. https://www.nature.com/articles/s41598-018-24057-z.
- US EPA. 2009. *Extreme Events: Abrupt Climate Change*. http://www.epa.gov/climatechange/effects/extreme.html>. U.S. Forest Services. 2020 On-Line Address: http://www.fs.fed.us/.
- U.S. Army Corps of Engineers (USACE). 2022. *Ice Jam Database*. August. Accessed August 2022. https://icejam.sec.usace.army.mil/ords/f?p=101:7

Section 5.4.6 – Hazardous Materials

- Constellation Energy Corporation. 2022. "Emergency Planning for the R.E. Ginna Nuclear Power Plant." *Monroe County Office of Emergency Management*. Accessed September 7, 2022. https://www.monroecounty.gov/files/ps/Ginna-Monroe_2022-2023-Brochure_FNL.pdf.
- Monroe County. 2022. Transportation (DOT). https://www.monroecounty.gov/dot.
- National Fuel Gas Company. 2020. "Empire Pipeline's System." *National Fuel*. September 18. Accessed September 21, 2022. https://www.nationalfuel.com/pipeline-storage/empire-pipeline/maps-and-points/.
- NYC. 2019. "CBRN Releases." NYS Hazard Mitigation. Accessed 2021. https://nychazardmitigation.com/hazard-specific/chemical-biological-radiological-and-nuclear-releases-cbrn/.
- NYS DEC. 2014. *Spills Incidents Database*. Accessed September 7, 2022. https://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=2.
- New York State Energy Research and Development Authority (NYSERDA). 2011/2014. ClimAID Updating the 2011 ClimAID Climate Risk Information. Albany: NYS. https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.





- Office of Emergency Management.
 2022.
 "Hazardous Materials Respone Plan." Monroe County Office of Emergency Management.
 May.
 Accessed
 September
 7,
 2022.

 https://www.monroecounty.gov/files/oem/2022%20HAZMAT%20Response%20Plan.pdf.
- United States Environmental Protection Agency (U.S. EPA). 2022. CERCLA Hazardous Substance Defined. February 24. https://www.epa.gov/epcra/cercla-hazardous-substances-defined.
- United States Environmental Protection Agency (U.S. EPA). 2022. *Superfund: CERCLA Overview*. February 14. https://www.epa.gov/superfund/superfund-cercla-overview.
- United States Environmental Protection Agency (U.S. EPA). 2022. *Title* 40. Septmeber 2. <u>https://www.ecfr.gov/current/title-40/chapter-I/subchapter-J/part-307/subpart-A</u>.

Section 5.4.7 - Infestation and Invasive Species

- Cornell Cooperative Experience. 2019. *Brown Marmorated Stink Bug.* November 27. Accessed September 1, 2022. https://monroe.cce.cornell.edu/environment/invasive-nuisance-species/invasive-pests/brown-marmorated-stink-bug.
- Cornell Cooperative Experience. 2019. *New York State Hemlock Initiative*. February 26. Accessed September 2, 2022. https://blogs.cornell.edu/nyshemlockinitiative/hemlock-woolly-adelgid/.
- Cornell Cooperative Extension. 2021. Armyworm. March 2. Accessed September 1, 2022. https://monroe.cce.cornell.edu/environment/invasive-nuisance-species/invasive-pests/armyworm.
- Cornell
 Cooperative Experience.
 2018. Hemlock Woolly Adelgid in Monroe County and New York State.

 February
 26.
 Accessed
 September
 1,
 2022.

 https://monroe.cce.cornell.edu/events/2017/02/28/hemlock-woolly-adelgid-in-monroe-county-and-new-york-state.
 new-york-state.
 1,
 2022.
- Democrat & Chronicle. 2014. *Invasive weed black swallow-wort speads in Monroe*. Newspaper, Rochester: Democrat & Chronicle.
- EDDMaps. 2022. University of Georgia; Brown Marmorated Stink Bug. Accessed September 1, 2022. https://www.eddmaps.org/distribution/uscounty.cfm?sub=9328&map=density.
- Finch, Deborah M., Jack L. Butler, Justin B. Runyon, Christopher J. Fettig, Francis F Kilkenny, Jose Shibu, Susan Frankel, et al. 2021. "Effects of Climate Change on Invasive Species." In *Invasive Species in Forests and Rangelands of the United States*, 57-84. Poland: Springer.
- Masters, Greg, and Lindsey Norgrove. 2010. Climate Change and Invasive Alien Species. Working Paper, CABI.
- Monroe County Soil & Water Conservation District. 2020. *Emerald Ash Borer*. Accessed September 4, 2022. https://www.monroecountyswcd.org/page-57.html.
- Natural Resource Defense Council. 2015. "Climate Changes Threatens Health." *Natural Defense Council*. October 13. Accessed August 29, 2022. https://www.nrdc.org/resources/climate-change-threatens-health.





- New York Codes, Rules, and Regulations. 2022. "Conditions governing regulated invasive species." *Legal Information Institute (LII)*. April 6. Accessed September 1, 2022. https://www.law.cornell.edu/regulations/new-york/6-NYCRR-575.6.
- New York Invasive Species (IS) Information. 2022. New York Invasive Species (IS) Information. Accessed August 29, 2022. https://nyis.info/partners/.
- New York State Integrated Pest Management. 2022a. Spotted Lanternfly. https://nysipm.cornell.edu/environment/invasive-species-exotic-pests/spotted-lanternfly/.
- New York State Department of Environmental Conservation (NYSDEC). 2020. "Confirmed Hemlock Woolly
Adelgid in New york State by Town." New York State Department of Environmental Conservation.January.AccessedSeptember5th,2022.https://www.dec.ny.gov/docs/lands_forests_pdf/hwadistribution1.10.20.pdf.
- New York State Department of Environmental Conservation (NYSDEC). 2021. Emerald Ash Borer (EAB). Accessed September 1, 2022. https://www.dec.ny.gov/animals/7253.html.
- New York State Department of Environmental Conservation (NYSDEC). 2018. *Hemlock Woolly Adelgid*. Accessed September 1, 2022. https://www.dec.ny.gov/animals/7250.html.
- New York State Department of Environmental Conservation (NYSDEC). n.d. *Invasive Speciec Regulations*. Accessed August 29, 2022. https://www.dec.ny.gov/animals/99141.html.
- New York State Department of Environmental Conservation (NYSDEC). 2022. Invasive Species Council and Advisory Committee. Accessed September 1, 2022.

 https://www.dec.ny.gov/animals/6989.html#:~:text=Invasive%20Species%20Council%201%20About %20the%20Council.%20The,Membership.%20...%203%20Role%20of%20the%20Council.%20.
- New York State Energy Research and Development Authority (NYSERDA). 2011/2014. *ClimAID Updating the* 2011 *ClimAID Climate Risk Information*. Albany: NYS. https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- U.S. Department of Agriculture (USDA). 2017. 2017 Census of Agriculture Monroe County New York. <u>https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/New_Yo</u> <u>rk/cp36055.pdf</u>.

Section 5.4.8 - Landslide

- Cornell University. 2017. "2017 County and Economic Development Regions Population Estimates." CornellProgramonAppliedDemographics.https://pad.human.cornell.edu/papers/downloads/Vintage%202017%20report.pdf.
- United States Environmental Protection Agency (U.S. EPA). 2013. "Climate Change Impacts and Adapting to Change." September 9. http://www.epa.gov/climatechange/impacts-adaptation/.
- United States Environmental Protection Agency (U.S. EPA). "Climate Change: Northeast Impacts & Adaptation." June 21. http://www.epa.gov/climatechange/impacts-adaptation/northeast.html.





- Lacrosse Tribune. 2020. ""Monroe County house damaged by landslide"." *Lacrosse Tribune*. August. https://lacrossetribune.com/community/tomahjournal/news/monroe-county-house-damaged-by-landslide/article_f5367586-5cf4-58b3-b667-bd0750663c6a.html.
- New York State Energy Research and Development Authority (NYSERDA). n.d. "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for the Effective Climate Change Adaptation in New York State." https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2014. "2014 New York State Standard Multi-Hazard Mitigation Plan." http://www.dhses.ny.gov/oem/mitigation/plan.cfm.

NYS Geological Survey. n.d. http://www.nysm.nysed.gov/nysgs/nygeology/landslides.

- New York State Energy Research and Development Authority (NYSERDA). 2014. "Responding to Climate Change in New York State." https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- New York State Energy Research and Development Authority (NYSERDA). 2011. "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation in New York State." https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Environmental/EMEP/climaid/ClimAID-Report.pdf.
- Radbruch-Hall, Dorothy H., et. al. 1982. *Landslide Overview Map of the Conterminous United States*. Washington: United States Government Printing Office.
- U.S. Geologic Survey (USGS). 2013. http://landslides.usgs.gov/aboutus.
- U.S. Geologic Survey (USGS). 2020. Ground Failure. https://earthquake.usgs.gov/data/ground-failure/.

Section 5.4.9 - Severe Storm

- Division of Homeland Security and Emergency Services (DHSES), NYS. 2019. 2019 New York State Hazard Mitigation Plan. Accessed 2021. https://mitigateny.availabs.org/.
- National Aeronautics and Space Administration (NASA). 2013. *Severe Thunderstorms and Climate Change*. <u>https://climate.nasa.gov/news/897/severe-thunderstorms-and-climate-change/</u>.
- National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center (SPC). 2017. "Understanding Severe Thunderstorm Risk Categories" Online address: https://www.spc.noaa.gov/misc/about.html
- National Oceanic and Atmospheric Administration (NOAA). 2019. *Climate Change Impacts*. https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts.





- National Oceanic and Atmospheric Administration (NOAA). n.d. *Historical Hurricane Tracks*. Accessed August 2022. https://coast.noaa.gov/hurricanes/#map=7.03/43.302/-77.696&search=eyJzZWFyY2hTdHJpbmciOiJNb25yb2UgQ291bnR5LCBOZXcgWW9yaywgVVNB Iiwic2VhcmNoVHlwZSI6Imdlb2NvZGVkIiwib3NtSUQiOiIxODA0MzExIiwiY2F0ZWdvcmllcyI6W yJINSIsIkg0IiwiSDMiLCJIMiIsIkgxIiwiVFMiLCJURCJdLCJ5Z.
- National Oceanic and Atmospheric Administration (NOAA). 2011. *Tropical Cyclone Climatology*. https://www.nhc.noaa.gov/climo/.
- National Severe Storms Library (NSSL). 2021. Severe Weather 101 Hail Basics. Accessed 2021. https://www.nssl.noaa.gov/education/svrwx101/hail/.
- National Weather Service (NWS). 2012. "Air Pressure and Wind." November 9. Accessed 2021. https://www.weather.gov/media/zhu/ZHU_Training_Page/winds/pressure_winds/pressure_winds.pdf.
- National Weather Service (NWS). 2020. Definitions, Thresholds, Criteria for Warnings, Watches and Advisories. https://www.weather.gov/ctp/wwaCriteria.
- National Weather Service (NWS). 2021. National Weather Service Glossary. Accessed 2021. https://forecast.weather.gov/glossary.php.
- National Weather Service (NWS). 2010. "Thunderstorms, Tornadoes, Lightning...Nature's Most Violent Storms." June 25. Accessed 2021. https://www.weather.gov/media/owlie/ttl6-10.pdf.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. "New York State Hazard Mitigation Plan." https://mitigateny.availabs.org/.
- New York State Energy Research and Development Authority (NYSERDA). 2014. "Responding to Climate Change in New York State." https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- New York State Energy Research and Development Authority (NYSERDA). 2011. "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation in New York State." https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Environmental/EMEP/climaid/ClimAID-Report.pdf.
- U.S. Geologic Survey (USGS). 2020. Ground Failure. https://earthquake.usgs.gov/data/ground-failure/.

Section 5.4.10 – Severe Winter Storm

- Cornell University College of Agriculture and Life Sciences. 2011. New York Climate Change. Accessed 2022. http://senecacountycce.org/resources/new-york-s-changing-climate.
- Cornell University. 2017. Monroe County Population Projection. Ithaca: Cornell Program for Applied Demographic. https://hudsonvalleyregionalcouncil.org/wp-content/uploads/2019/08/Westchester-County-Profile-2017.pdf.
- Dolce, Chris. 2012. *How to Stay Safe From Ice Storm*. https://weather.com/en-CA/canada/news/news/2018-01-03-ice-storm-damage-impacts-20121123.





Lam, Linda. 2019. "Ground Blizzards: Why Blizzard Warnings are Issued with Little or No Falling Snow."

- National Oceanic and Atmospheric Administration (NOAA). 2021. National Oceanic and Atmospheric Administration. Accessed August 2022. https://www.nssl.noaa.gov/education/svrwx101/winter/types/.
- National Oceanic and Atmospheric Administration (NOAA). n.d. *Regional Snowfall Index (RSI)*. Accessed August 2022. https://www.ncei.noaa.gov/access/monitoring/rsi/.
- National Severe Storms Library (NSSL). 2021. Glossary of Terms. NSSL. https://w1.weather.gov/glossary/.
- National Severe Storms Library (NSSL). 2021. Severe Weather 101 Winter Weather. NSSL. https://www.nssl.noaa.gov/education/svrwx101/winter/types/.
- National Weather Service (NWS). 2021. Definitions, Threshold, Criteria for Warning. NWS.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. *Mitigate NY*. Albany: NYS. https://mitigateny.availabs.org/.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. "Snow Storm." *MitigateNY*. Accessed August 26, 2022. https://mitigateny.availabs.org/hazards/winterweat.
- New York State Energy Research and Development Authority (NYSERDA). 2011/2014. ClimAID Updating the 2011 ClimAID Climate Risk Information. Albany: NYS. https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- NYSkiBlog. 2022. "New York State Annual Snowfall Map." *NYSkiBlog*. Accessed August 26, 2022. https://nyskiblog.com/directory/weather-data/new-york/state-average-snowfall-map/.
- US Census. 2020. Explore Data. Accessed 2021. https://www.census.gov/.
- U.S Department of Agriculture (USDA). 2022. U.S. Department of Agriculture . Accessed 2022. https://www.usda.gov/.
- United States Geological Survey (USGS). 2020. "Snowmelt Runoff and Water Cycle." <u>https://www.usgs.gov/special-topic/water-science-school/science/snowmelt-runoff-and-water-cycle?qt-science_center_objects=0#qt-science_center_objects.</u>

Section 5.4.11 - Wildfire

- Burgan, R, R Klaver, and J Klaver. 2000. "Fuel Models and Fire Potential from Satellite and Surface Observations." *USFS WFAS*. https://www.wfas.net/index.php/nfdrs-next-day-forecast-experimental-products-39/35-fpi-paper.
- Cornell University. 2017. "2017 County and Economic Development Regions Population Estimates." CornellProgramonAppliedDemographics.https://pad.human.cornell.edu/papers/downloads/Vintage%202017%20report.pdf.
- Environmental Protection Agency (EPA). 2013. "Climate Change: Northeast Impacts & Adaptation." June 21. http://www.epa.gov/climatechange/impacts-adaptation/northeast.html.





- Federal Emergency Management Agency (FEMA). 1997. "Avoiding Wildfire Damage: A Checklist for Homeowners." *FEMA*. https://www.fema.gov/pdf/hazard/wildfire/wdfrdam.pdf.
- Federal Emergency Management Agency (FEMA). 2022. "Disaster Information." *FEMA*. https://www.fema.gov/disasters.
- Lee. 2014. *Climate Change May Spark More Lightning Strikes, Igniting Wildfires.* https://news.nationalgeographic.com/news/2014/11/141113-climate-change-lightning-atmosphere-science/.
- Monroe County. 2015. "Monroe County Fire Wire." August 5. http://mcfw.com.
- National Aeronautics and Space Administration (NASA). 2015. "Fire Information for Resource Management System Web Fire Mapper." https://firms.modaps.eosdis.nasa.gov/firemap/.
- North Carolina Forest Service. 2009. "NC FIre Danger Technote 03." May 15. https://www.ncforestservice.gov/fire_control/pdf/technotes/FDTN03.pdf.
- Northern Virginia Regional Comission (NVRC). 2006. "Northern Virginia Regional Hazard Mitigation Plan." Northern Virginia Regional Commission. http://www.novaregion.org/index.aspx?NID=661.
- National Weather Service (NWS). 2009. "Fire Weather Glossary." *National Weather Service*. https://www.weather.gov/okx/fireweatherglossary.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2019. https://mitigateny.availabs.org/hazards/drought.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2011. "2011 New York State Standard Multi-Hazard Mitigation Plan." *New York State Division of Homeland Security and Emergency Services*. http://www.dhses.ny.gov/oem/mitigation/archive/hm-plan-2011.cfm.
- New York State Division of Homeland Security and Emergency Services (NYS DHSES). 2014. "2014 New York State Standard Multi-Hazard Mitigation Plan." http://www.dhses.ny.gov/oem/mitigation/plan.cfm.
- New York State Department of Environmental Conservation (NYSDEC). 2018. "2018 Wildland Fire Protection Areas." https://www.dec.ny.gov/lands/68331.html.
- New York State Department of Environmental Conservation (NYSDEC). n.d. "FIREWISE New York Wildland Fire Safety and Prevention." Accessed 2022. https://www.dec.ny.gov/lands/42524.html.
- New York State Department of Environmental Conservation (NYSDEC). 2019. "Forest Ranger Division Fact Sheet for 2019." https://www.dec.ny.gov/regulations/2369.html.

New York State Department of Environmental Conservation (NYSDEC). 2022. "Forest Ranger Rosters." https://www.dec.ny.gov/about/667.html.

- New York State Department of Environmental Conservation (NYSDEC). 2022. "New York State Fire Danger Rating Area." August 30. https://www.dec.ny.gov/lands/68329.html.
- New York State Department of Environmental Conservation (NYSDEC). 2022. "Wildfires." New York State Department of Environmental Conservation. https://www.dec.ny.gov/lands/4975.html.





- New York State Energy Research and Development Authority (NYSERDA). 2014. "2014 Supplement Updated Climate Projections Report." http://www.nyserda.ny.gov/climaid.
- New York State Energy Research and Development Authority (NYSERDA). 2011. "Responding to Climate Change in New York." http://www.nyserda.ny.gov/climaid.
- New York State Energy Research and Development Authority (NYSERDA). 2011. "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for the Effective Climate Change Adaptation in New York State." https://www.nyserda.ny.gov/About/Publications/Research%20and%20Development%20Technical%2 0Reports/Environmental%20Research%20and%20Development%20Technical%20Response %20to%20Climate%20Change%20in%20New%20York.
- Radeloff, Volker C. 2018. "Rapid growth of the US wildland-urban interface raises wildfire risk."
- Sustainable Defensible Space. n.d. "FAQ." Accessed 2022. https://defensiblespace.org/faq/.
- US Environmental Protection Agency (US EPA). 2020. "Climate Change Indicators in the United States." Washington DC.
- U.S. Department of Agriculture (USDA). 2012. "2012 Census of Agriculture for Monroe County, New York." http://agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/New_York/cp36055.p df.
- U.S. Department of Agriculture (USDA). 2012a. "Effects of Climatic Variability and Change on Forest Ecosystems: A Comprehensive Sceince Synthesis for the U.S. Forest Sector." December. http://www.usda.gov/oce/climate_change/effects_2012/FS_Climate1114%20opt.pdf.
- U.S. Department of Agriculture (USDA). n.d. "Fire Effects on the Environment." Accessed 2022. https://www.fs.usda.gov/pnw/page/fire-effects-environment.
- U.S. Department of Agriculture (USDA). 2011. "Wildland Fire." https://www.fs.usda.gov/ccrc/topics/wildfire.
- U.S. Forest Service (USFS). n.d. "Fire Danger Rating Wildland Fire Assessment System." USFS. http://www.wfas.net/index.php/fire-danger-rating-fire-potential--danger-32.
- U.S. Forest Service (USFS). n.d. "Haines Index." U.S. Forest Service. https://www.wfas.net/index.php/hainesindex-fire-potential--danger-34.
- U.S. Forest Service (USFS). n.d. "Influence of Forest Structure on Wildfire Behavior and the Severity of Its Effects: An Overview." http://www.fs.fed.us/projects/hfi/docs/forest_structure_wildfire.pdf.
- U.S. Forest Service (USFS). n.d. "Keetch-Byram Drought Index." U.S. Forest Service. https://www.wfas.net/index.php/keetch-byram-index-moisture--drought-49.
- U.S. Geologic Survey (USGS). 2018. *Water Quality after a Wildfire*. https://ca.water.usgs.gov/wildfires/wildfires-water-quality.html.





APPENDIX A. ADOPTION RESOLUTIONS

The Monroe County and municipal adoption resolutions will be included in this appendix upon receipt of the Federal Emergency Management Agency (FEMA) Approval Pending Adoption (APA) status. Please refer to Section 8 (Planning Partnership) for additional information on plan adoption procedures.

This appendix also includes an example resolution to be submitted by Monroe County and participating jurisdictions authorizing adoption of the 2023 Monroe County Hazard Mitigation Plan Update.





Sample Resolution

(LOCAL GOVERNMENT, INCLUDING SPECIAL DISTRICTS), (STATE)

RESOLUTION NO.

A RESOLUTION OF THE (LOCAL GOVERNMENT) ADOPTING THE 2023 Monroe County Hazard Mitigation Plan

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within (local government); and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local community) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates their commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL COMMUNITY), (STATE), THAT:

Section 1. In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). This plan, approved by the community, may be edited or amended after submission for review, but will not require the community to re-adopt any further iterations. This only applies to this specific plan and does not absolve the community from updating the plan in 5 years.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of

Ву: _____

(print name)

ATTEST: By: _____

(print name)

APPROVED AS TO FORM: By: _____

(print name)





APPENDIX B. MEETING DOCUMENTATION

Appendix B includes meeting agendas, slides, and minutes (where applicable and available) for meetings convened during the development of the 2023 Monroe County Hazard Mitigation Plan Update.



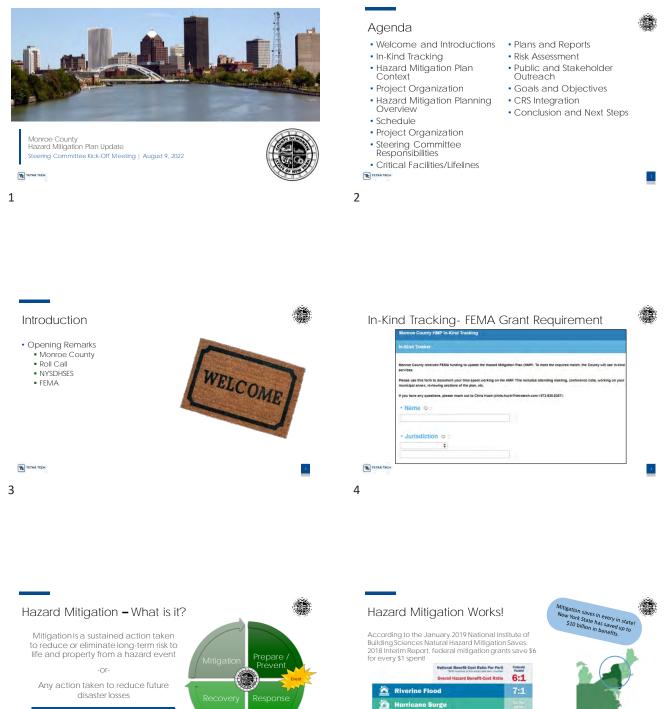


MONROE COUNTY HAZARD MITIGATION PLAN UPDATE STEERING COMMITTEE MEETING – AGENDA MEETING DATE/TIME: August 9, 2022 – 3:00 pm



Virtual Meeting

- Welcome and Introductions
- In-Kind Tracking
- Hazard Mitigation Plan Context
- Project Organization
- Hazard Mitigation Planning Overview
- Schedule
- Project Organization
- Steering Committee Responsibilities
 - o Review Steering Committee Guidelines
- Critical Facilities/Lifelines
- Plans and Reports
- Risk Assessment
- Hazards of Concern Exercise
- Public and Stakeholder Outreach
- Goals and Objectives
 - o Goals and Objectives Exercise
- CRS Integration
- Conclusion and Next Steps



Wind

Wildland-Urban Interface Fire

🕋 Earth 🚰 Wildla

TE TETRA TECH

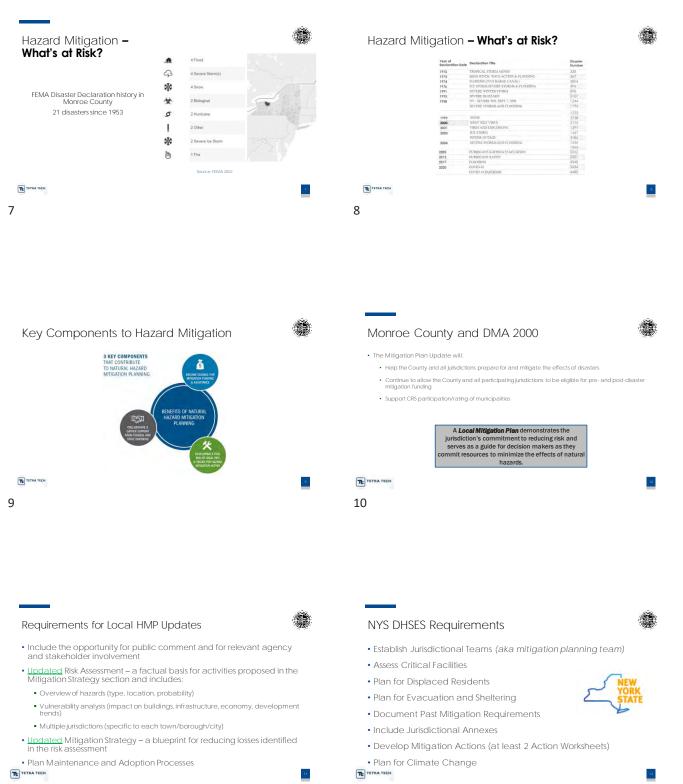
6

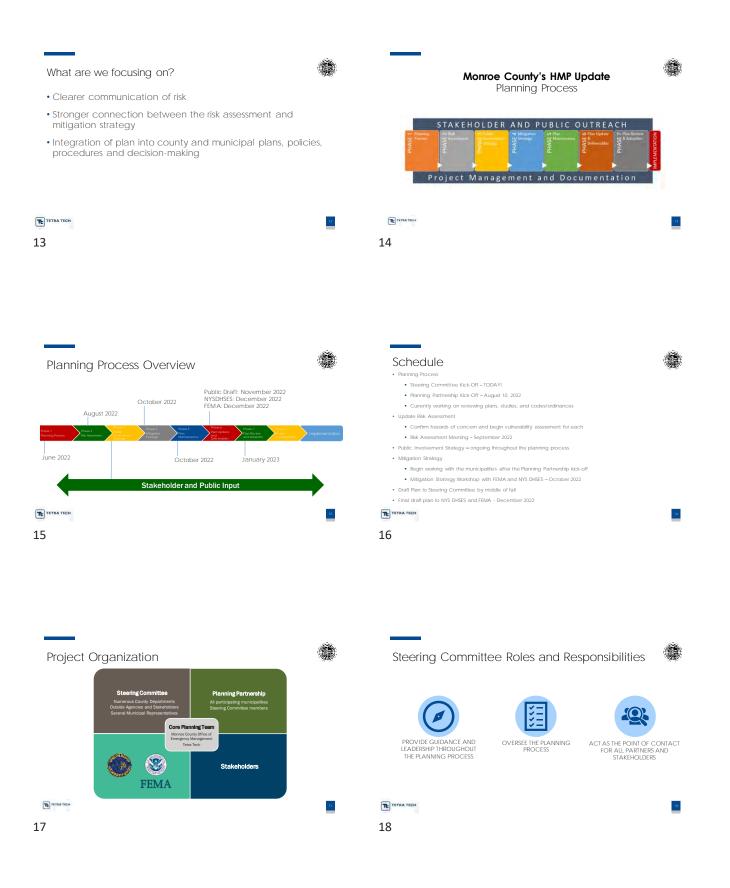
"provides the blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and local ability..." (CFR).

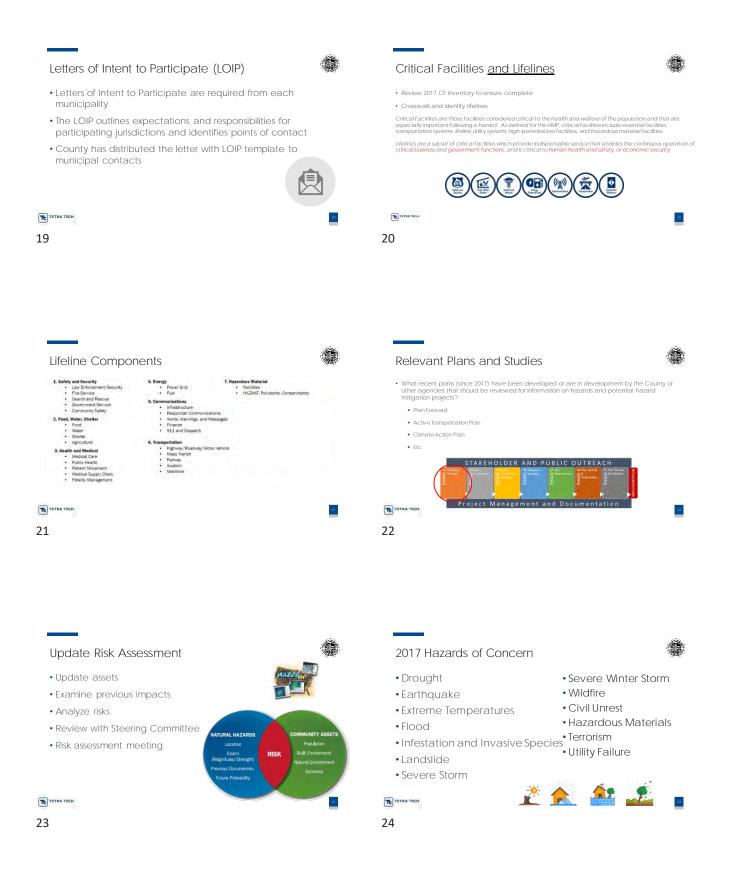


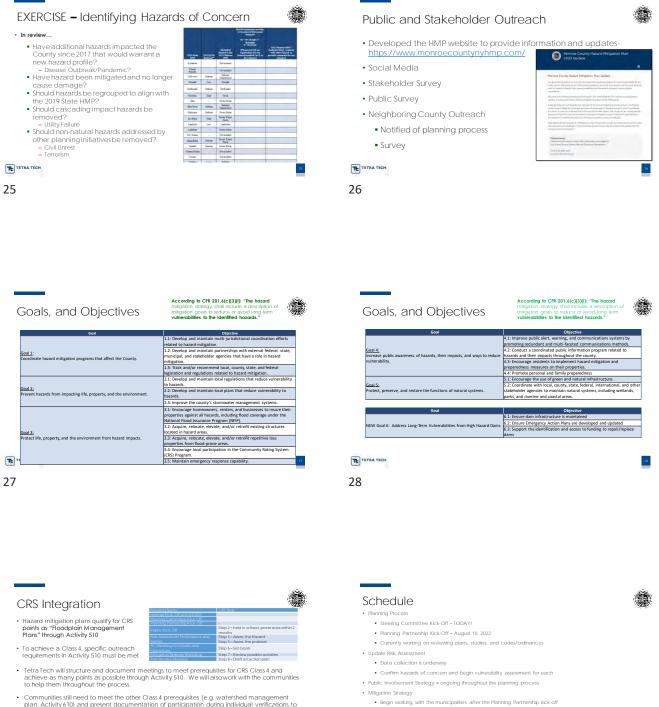
5

TETRA TECH









- Communities still need to meet the other Class 4 prerequisites (e.g. watershed management plan, Activity 610) and present documentation of participation during individual verifications to meet Class 4
- · All meetings must be open to the public

· All meetings must be documented on the County's website

TE TETRA TECH

29

TE TETRA TECH

Mitigation Strategy Workshop with FEMA and NYS DHSES – October 2022

Draft Plan to Steering Committee by middle of fall

• Final draft plan to NYS DHSES and FEMA - December 2022

Steering Committee Next Steps

Planning Partnership Kick-Off (Steering Committee and Municipalities) – August
10th

(1)

- Return worksheet to update Goals
- Return worksheet to update Hazards of Concern
- Start tracking In-Kind hours via online survey- to be distributed via email
- Confirm access to OneDrive access to be provided in separate email
- Steering Committee Risk Assessment Meeting September 2022
- Risk Assessment Meeting September 2022
- Mitigation Strategy Workshop October 2022
- Review Draft Plan



31

Questions?







Purpose of Meeting:	Steering Committee meeting
Location of Meeting:	Teleconference Zoom Meeting
Date of Meeting:	August 9, 2022 3:00 – 4:00 pm

Attendees:

Timothy Henry, Deputy Director of Public Safety & Emergency Management, Monroe County Matthew Jarrett, Monroe County Office of Emergency Management Elisabeth Clower, Monroe County Office of Emergency Management Zach Laffin, Monroe County Office of Emergency Management Chris Huch, Tetra Tech, Project Manager Erika Corsi, Tetra Tech, Planner Karen St. Aubin, Director, Bureau of Operations, City of Rochester Bill Carpenter, CEO, RGRTA Casey Kosiorek, Superintendent Town of Hilton School District Chuck DiSalvo, Emergency Ianner, MCC Jenn VanHouter – Monroe County, GIS Steve Schultz, Town Supervisor, Town of Henrietta Clement Chung- Deputy Director, Department of Environmental Services, Monroe County Kelly Emerick – Director of Soil and Water, Monroe County Erin Magee. Commissioner of Public Works. Town of Irondequoit

Agenda Summary:

ltem No.	Description	Action item(s):
1	 Welcome Meeting started at 3:00 pm 	
2	 HMP Update In- Kind Tracking –fill out tracker whenever work is being done on planning process. With hours and task 3 components in natural hazard mitigation planning – eligibility, developing toolbox, collaborate and gather support FEMA new standards go into effect April 2023 – will be using new standards for update process – 2023 requirements Updated risk assessment – overview of hazards, vulnerability analysis, multi-jurisdictions – risk assessment will be done at County level but will be specific to each Town, City, Village Update mitigation strategy NYS Requirements – establish jurisdictional teams, assess critical facilities, plan for displaced residents, plan for evacuation and sheltering, document past mitigation, include jurisdictional annexes, develop mitigation actions (2 action worksheets AT LEAST), plan for climate change Clearer communication of risk Plan must have a public review phase – 30 days 	 Send out link for in-kind tracker Steering Committee to complete Hazard of Concern exercise by August 16





	 Planning Partnership – county, steering committee, jurisdictional 	
	reps from participating jurisdictions	
	 Core planning team – Monroe County Office of Emergency 	
	Management and Tetra Tech	
	 2017 Hazards of Concern will need to be reviewed 	
	 Recommend adding disease outbreak, remove non-natural 	
	hazards	
3	Critical Facilities and Lifeline	
	• Lifelines provide indispensable service i.e., fire stations, police station	
	Review 2017 CF Inventory	
	Crosswalk and identify lifelines	
	 Lifelines – safety and security, food, water, and shelter, 	
	health and medical, energy, communications, transportation,	
	hazardous materials	
4	Relevant Plans and Studies	
	• Mr. Huch asked for County level plans that have been developed or	
	updated since 2017	
	 Clement Chung – in development of climate action plan, and plan 	
	forward (comp plan) – having coordination between agencies to hit	
	State and Federal requirements both climate action, plan forward	
	and HMP	
	 Kelly Emerick – Coastal Lakeshore Economy and Resiliency (CLEAR) 	
	Plan, Resilient NY Food Mitigation Initiative, Irondequoit Creek	
	• Steve Schultz, Town of Henrietta – Active Transportation Plan (2016),	
	Local Waterfront Revitalization Program (LWRP) (in-development)	
4	Letters of Intent to Participate (LOIP)	
	 LOIP is requested from each municipality – to ensure Tetra Tech can 	
	begin contact and get started on their sections of the plan	
5	Steering Committee	Review Steering
	• Roles and responsibilities – provide guidance, oversee the planning	Committee Guidelines
	process, act as the point of contact for all partners and stakeholders	 Complete Goals and
	 Steering Committee will need to review goals and objectives 	Objectives exercise and
		return by August 16
	Community Rating System (CRS) Integrations	
	• HMP is being developed to qualify for points in the CRS floodplain	
	management section	
	 Clement Chung– County working with DEC for Climate Smart 	
	Community Project to encourage communities to join CRS– ongoing	
	for several months	
9	Conclusion	

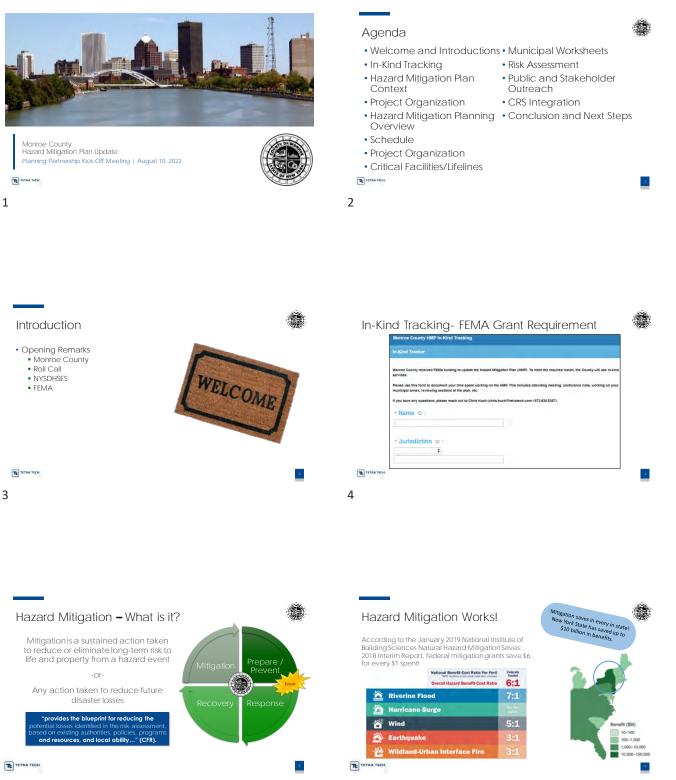


MONROE COUNTY HAZARD MITIGATION PLAN UPDATE PLANNING PARTNERSHIP KICKOFF MEETING – AGENDA MEETING DATE/TIME: August 10, 2022 – 9:00 am



Virtual Meeting

- Welcome and Introductions
- In-Kind Tracking
- Hazard Mitigation Plan Context
- Project Organization
- Hazard Mitigation Planning Overview
- Schedule
- Project Organization
- Critical Facilities/Lifelines
- Municipal Worksheets
- Risk Assessment
- Public and Stakeholder Outreach
- CRS Integration
- Conclusion and Next Steps





TE TETRA TECH

12

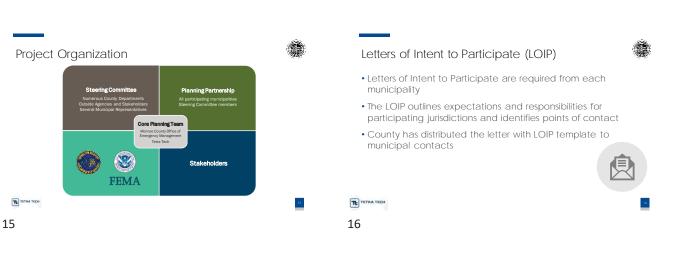
TETRA TECH

What are we focusing on?



- Stronger connection between the risk assessment and mitigation strategy
- Integration of plan into county and municipal plans, policies, procedures and decision-making





Planning Process Overview

August 2022

June 2022

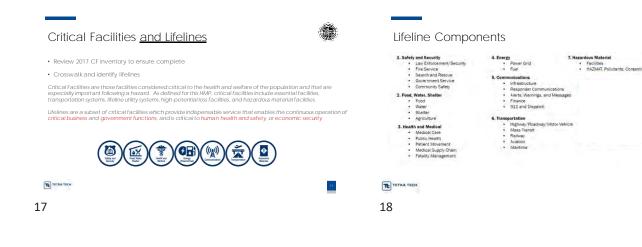
October 2022

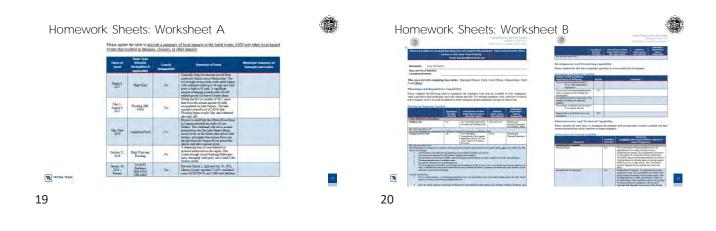
October 2022

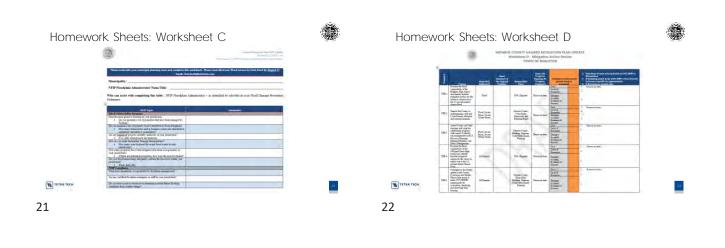
Public Draft: November 2022 NYSDHSES: December 2022 FEMA: December 2022

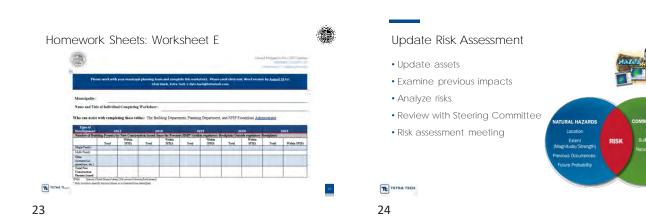
> Phase 7 Plan Review

> > January 2023









EXERCISE - Identifying Hazards of Concern 2017 Hazards of Concern In review... • Drought • Severe Winter Storm Have additional hazards impacted the County since 2017 that would warrant a new hazard profile? • Earthquake • Wildfire - Disease Outbreak/Pandemic? - Have hazard been mitigated and no longer cause damage? Danki Nir uclaske Rinida Civil Unrest • Extreme Temperatures Did one Midam Despetition Deside Zon Deside Hazardous Materials Refusió Status Refusió Promy Rab Root Should hazards be regrouped to align with the 2019 State HMP? • Flood Infestation and Invasive Species DarWine Median Datest Should cascading impact hazards be Should cascaoling impact nazards be removed? - Utility Failure Should non-natural hazards addressed by other planning initiatives be removed? - Civil Urrest - Terrorism Utility Failure In Some High Series View • Landslide Lanitide Lyne Lanitide Lalming - Seven Jaco • Severe Storm tern Medical Street Water <u>____</u> TE TETRA TECH TE TETRA TECH 25 26

Public and Stakeholder Outreach

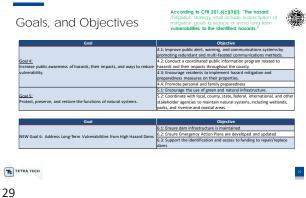
- Developed the HMP website to provide information and updates https://www.monroecountynyhmp.com/ Monroe C
- Social Media
- Stakeholder Survey
- Public Survey
- Neighboring Count
 - Notified of plann
 - Survey

TE TETRA TECH



/	(white spaces, labeling the space of this parent project, course and long harder and fractioners in an over to insert the labeling the spaces parameters and however is Causing in testing fractions opposition.
	Also was as the Harmer Charles Internal Historica Party (1979) Maletta Philippine Charles and an annual sector and a sector and the sector an
ty Outreach	(A) It put it put to not hereitable (by equipping) of out in some managed parents) parameters for a first parameters and the spectra of the source state of the sou
ning process	Let up the distribution of the distribution of a second second bit with a size of the distribution of the
	Protocol Services effective and a final service and produce and the protocol and a final service and the protocol Contrast of the service in the services
	Conviction Terry Day Service and Descention of
	27
	20





CRS Integration		
	Meeting Name Steering Committee Kick-Off	CRS Step
Hazard mitigation plans qualify for CRS points as "Floodplain Management	Planning Partnership Kick-Off Public Kick-Off	- Step 2 – held in a flood-prone area within 2 months
Plans" through Activity 510	Risk Assessment Presentation and SWOO SC Meeting #2 - Goals and	Step 4 – Assess the Hazard Step 5 – Assess the problem
To polyious a Class 4 encoific outropoly	Objectives	Step 6-Set Goals
To achieve a Class 4, specific outreach requirements in Activity 510 must be met	Mitigation Strategy Workshop Plan Review Meeting	Step 7 – Review possible activities Step 8 – Draft an action plan
Tetra Tech will structure and document me achieve as many points as possible through to help them throughout the process.		

- Communities still need to meet the other Class 4 prerequisites (e.g. watershed management plan, Activity 610) and present documentation of participation during individual verifications to meet Class 4
- · All meetings must be open to the public
- · All meetings must be documented on the County's website

TE TETRA TECH

30

(

Schedule

• Planning Process

- Steering Committee Kick-Off TODAY!
- Planning Partnership Kick-Off August 10, 2022
 Currently working on reviewing plans, studies, and codes/ordinances
- Update Risk Assessment
- Data collection is underway
- Confirm hazards of concern and begin vulnerability assessment for each
- Public Involvement Strategy ongoing throughout the planning process
- Mitigation Strategy
 - Begin working with the municipalities after the Planning Partnership kick-off
- Mitigation Strategy Workshop with FEMA and NYS DHSES October 2022
- Draft Plan to Steering Committee by middle of fall
- Final draft plan to NYS DHSES and FEMA December 2022

Tł	TETRA TECH





31

Planning Partnership Next Steps

- Return Worksheets Hazard of Concern Worksheet by August 16 (Optional)
- <u>Return Worksheets A through E by August 31!</u>
- Start tracking In-Kind hours via online survey- to be distributed via email
- Confirm access to OneDrive access to be provided in separate email
- Risk Assessment Meeting September 2022
- Mitigation Strategy Workshop October 2022
- Review Draft Plan

32









Purpose of Meeting:	Planning Partnership Kickoff meeting
Location of Meeting:	Teleconference Zoom Meeting
Date of Meeting:	August 10, 2022 9:00 – 10:00 am
Attendees:	
Elisabeth Clower, Monroe County Chris Huch, Tetra Tech, Project M Erika Corsi, Tetra Tech, Planner Dawn Forte, Town of Chili, Secret Kirk Morris, Town of Greece, DPV John Gauthier, Town of Greece, A Steve Schultz, Town of Henrietta, Rick Milne, Village of Honeoye Fa Scott Johnson, Village of Honeoye Mark Lenzi, Town of Parma, Build	ary to Town Supervisor V Commissioner Associate Engineer Supervisor IIs, Mayor e Falls, Assistant Fire Chief ling Inspector ord, Emergency Manager/Fire Marshal port, Village Clerk Superintendent of Public Works

Agenda Summary:

ltem No.	Description	Action item(s):
1	Welcome	
	 Meeting started at 9:00 am 	
2	 In-Kind Tracking Grant requirements for FEMA 	 Send out link for in-kind tracker Planning Partnership members can choose to complete Hazard of Concern exercise by August 16
3	 Hazard Mitigation Plan Context Mitigation -> Prepare/Prevent -> Response -> Recover -> Federal Mitigation grants saved 6 dollars for every 1 dollar spent Investing at state, local, and federal level Monroe County has had 21 disaster declarations Plan needs to be current for grant cycle/funding Support CRS participants/rating of municipalities – flood insurance premium reductions – Greece Class 5 – 25% reduction rate 	





		<u>.</u>
	• FEMA Update guidance – April 2023 – will be meeting the new 2023 standards	
	 Updates risk assessment – overview of hazards, vulnerability analysis, multiple jurisdictions 	
	 Updated mitigation strategy – identification of the projects 	
	 NYS DHSES Requirements – focus on certain local issues and address 	
	Federal requirements	
4	Project Organization	
	 Core Planning Team – Monroe County OEM and Tetra Tech 	
	 Steering committee – County departments, outside agencies and 	
	stakeholders	
	 Planning Partnership – all participating municipalities, Steering 	
	Committee	
	Stakeholders	
	FEMA & NYSDHSES	
5	Letters of Intent to Participate (LOIP)	Municipalities should
5	 LOIP is requested from each municipality – to ensure Tetra Tech can 	complete and submit
	begin contact and get started on their sections of the plan	their LOIP
6	Schedule	
	 Phase 2 – Risk Assessment – August 2022 	
	 Phase 3- Public Involvement Strategy 	
	 Phase 4 – Mitigation Strategy – October 2022 	
	 Phase 5 – Plan Maintenance – October 2022 	
	 Phase 6 – Plan Update and Development – November/December 	
	2022	
	 Phase 7 – Plan review and Adoption – Jan 2023 	
7	Critical Facilities and Lifelines	
	 Critical Facilities – considered critical to health and welfare of 	
	population – schools	
	 Lifelines – provides indispensable services that enables continuous 	
	operation of critical business – fire, police, hospital	
	· · · · · · · · · · · · · · · · · · ·	
8	Municipal Worksheets	Tetra Tech sending
	 Worksheet A – Past Events History – closures, dollar amount in 	Worksheets A-E to
	damages if possible	participating
	 Worksheet B – Capability Assessment – plans, staffing, outreach 	municipalities
	 Worksheet C – NFIP Floodplain Administrator – to be filled out by 	Municipalities to
	Floodplain Admin.	complete and return
	 Worksheet D – Mitigation Action Review – Provide status update on 	worksheets by August
	2017 actions and note which actions are to be included in 2023	31
	2017 actions and note which actions are to be included in 2023	





	 update. Anything discontinued needs an explanation of discontinuation Worksheet E – Building Permits – Fill out for brand new structures, in areas where there was no previous structure. 	
9	 Risk Assessment Additional hazard – disease outbreak – hazard mitigation \$ on the table for future planning efforts Utility failure - discontinued as a standalone hazard – it is a cascading impact Civil unrest, Terrorism to be discontinued as they are non-natural hazards and addressed in other planning efforts 	 Optional: Complete hazard of concern exercise by August 16
10	 Public and Stakeholder Outreach www.monroecountynyhmp.com set up and live Will complete stakeholder and public surveys Social media postings will be developed 	 Planning Partnership to assist with outreach announcements
11	 Goals and Objectives Looking into high hazard dams as potential new goal and objective 	 Optional: Complete goals and objectives exercise by August 16
12 9	 Community Rating System (CRS) Integrations HMP is being developed to qualify for points in the CRS floodplain management section Chili, Henrietta, and Penfield are all exploring the CRS program Conclusion 	



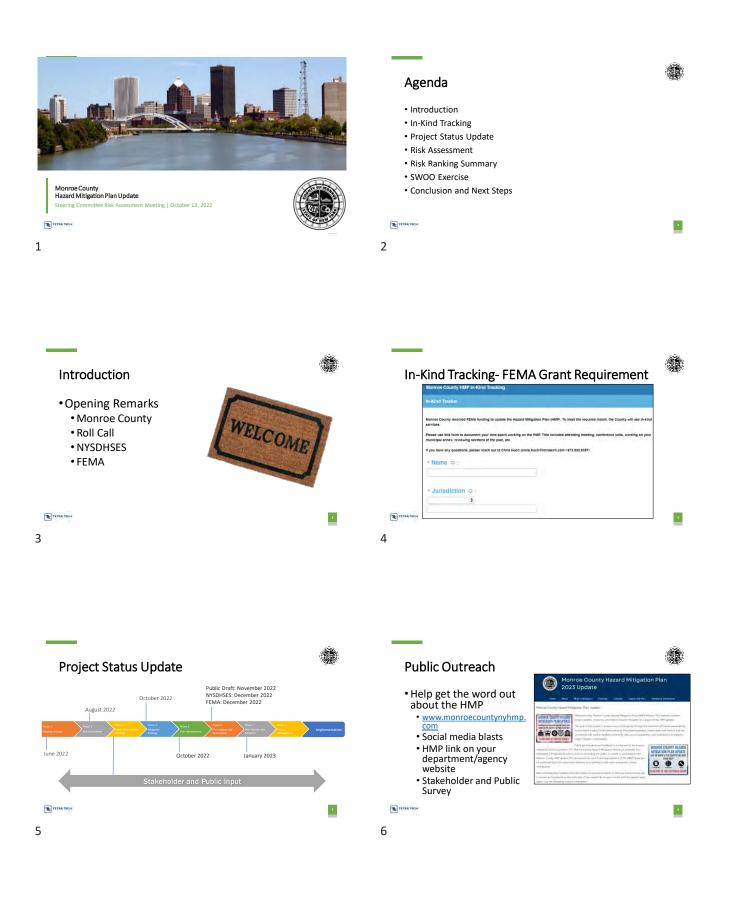


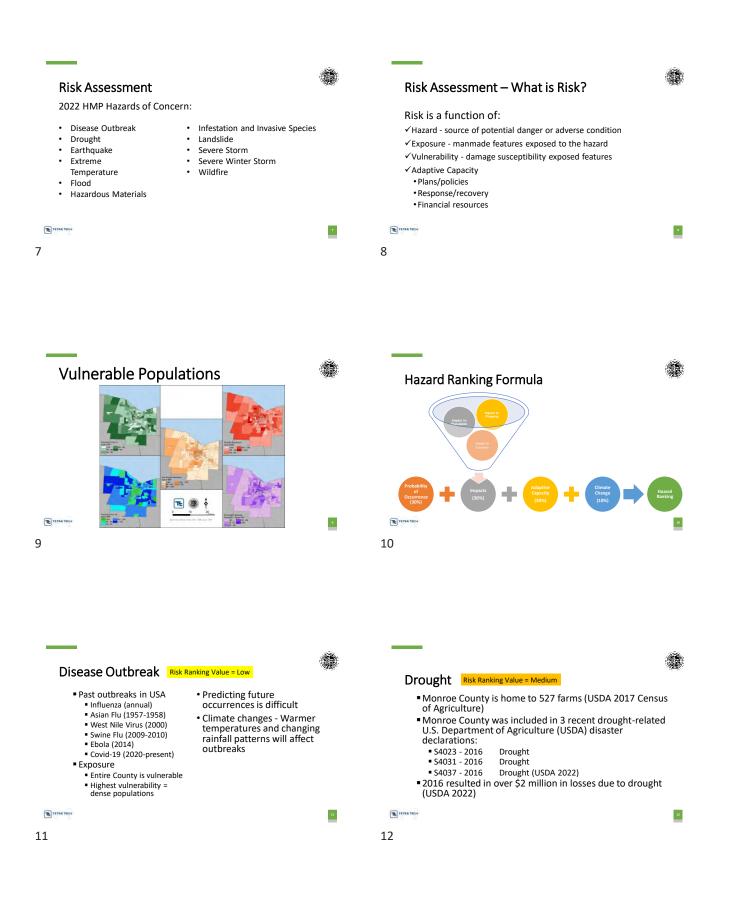
Steering Committee Risk Assessment Meeting

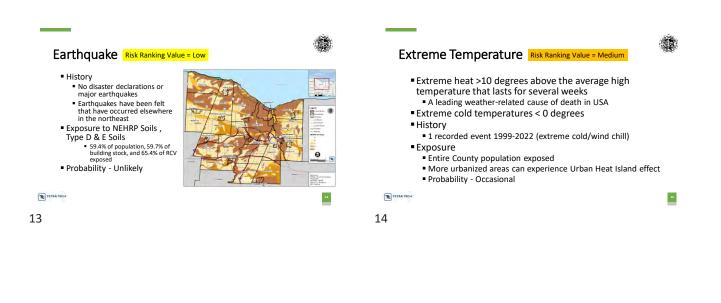
Join Zoom Meeting

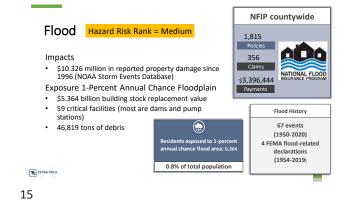
https://monroecounty-gov.zoom.us/j/85460523974?pwd=VWN4cmVHZTdaajE3MyszSFArOFRiQT09 Meeting ID: 854 6052 3974 Passcode: 85642664 One tap mobile +16468769923,,85460523974#,,,, *85642664# US (New York) +16469313860,,85460523974#,,,, *85642664# US

- Welcome and Introductions
- In-Kind Tracking
- Project Status Update
- Risk Assessment
- Risk Ranking Summary
- Hazards of Concern Exercise
- SWOO Exercise: <u>https://www.surveymonkey.com/r/MonroeSWOO</u>
- Conclusion and Next Steps















- Spotted Lanternfly
- Predicting future occurrences is difficult

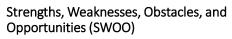
TE TETRA TECH

18

change.



	IKING JU	i i i i i ai y	- County	wide	Lo
					Med
Hazard of Concern	Probability x 30%	Total Impact x 30%	Adaptive Capacity x 30%	Changing Future Conditions x 10%	Total Risk Ranking Value
Disease Outbreak	0.6	2.7	0	0.2	3.5
Drought	0.6	3	0	0.3	3.9
Earthquake	0	3.6	0	0.1	3.7
Extreme Temperature	0.6	3	0	0.3	3.9
Flood	0.6	3.3	0	0.3	4.2
Hazardous Materials	0.3	3	0	0.1	3.4
Invasive Species	0.6	2.1	0.3	0.3	2.7
Landslide	0	3.6	0	0.2	3.8
Severe Storm	0.9	4.2	-0.3	0.3	
Severe Winter Storm	0.9	4.5	-0.3	0.2	5.3
Wildfire	0.6	1.8	0	0.2	2.6



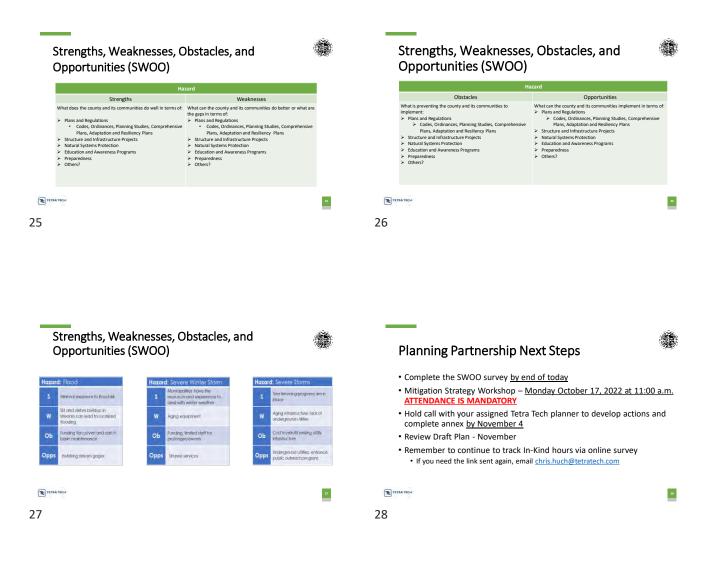


• Strengths - what mitigation actions does our town/village/city already do?

- Weaknesses what could we do better?
- Obstacles what impedes us from taking mitigation action? What is a challenge to overcome?
- Opportunities used to develop mitigation strategies

https://www.surveymonkey.com/r/MonroeSWOO

TE TETRA TECH







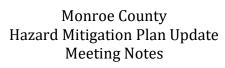






i uipe	se of Meeting:	Steering Committee Risk Assessment Meetin	g
Locati	on of Meeting:	Teleconference Teams Meeting	
Date	of Meeting:	October 13, 2022 10:00am – 11:00am	
E C F F S C C E C K	Matthew Jarrett, Monroe County Elisabeth Clower, Monroe County Clement Chung, Monroe County E Andrew Sansone, Monroe County De Rochelle Bell, Monroe County De Celly Emerick, Monroe County De Cott McCarty, Monroe County D Chris Huch, Tetra Tech, Project M Erika Corsi, Tetra Tech, Planner Chuck DiSalvo, Monroe Communi Caren St Aubin, City of Rochester	ty College, Public Safety	r Associate Planner ector
J E S	amie Renner, City of Rochester F Frin Magee, Irondequoit DPW, De Shannon Clarke, DHSES Roland Paperman, DHSES	ire Department, Captain	system Safety Manager
J E S F	amie Renner, City of Rochester F Frin Magee, Irondequoit DPW, De Shannon Clarke, DHSES	ire Department, Captain	System Safety Manager
ا E F Agend	amie Renner, City of Rochester F Frin Magee, Irondequoit DPW, De Shannon Clarke, DHSES Roland Paperman, DHSES	ire Department, Captain	Action item(s):
J E S F Agend	amie Renner, City of Rochester F Frin Magee, Irondequoit DPW, De Shannon Clarke, DHSES Roland Paperman, DHSES	ire Department, Captain eputy Commissioner Description	
J E S F Agend Item No.	amie Renner, City of Rochester F Frin Magee, Irondequoit DPW, De Shannon Clarke, DHSES Roland Paperman, DHSES da Summary: Welcome and Introductions • Meeting started at 10:0 In-Kind Tracking	ire Department, Captain eputy Commissioner Description 20 am ded to fill out the in-kind tracking form for	

	 encouraged to attend Tail end of October – maintenance procedures, review sections of the draft plan, plan for public review in mid November – 30 day period – send to DHSES early December 	
4	 Risk Assessment Each hazard of concern has a stand alone hazard profile Climate change is a new requirement for HMPs and included in the risk assessment 	 Continue to work with FEMA to obtain updated NFIP data
	 Adaptive capacity is included in risk rankings as well. 	





7	Conclusion - The meeting concluded at 11:00 am	week			
	 The Planning Partnership is also completing the SWOO <u>https://www.surveymonkey.com/r/MonroeSWOO</u> 	 Submit SWOO by end of week 			
	Steering Committee to complete a SWOO.	via email			
6	SWOO Exercise	Request will be sent out			
	 Wildfire: Low 				
	 Severe Winter Storm: High 				
	 Severe Storm: High 				
	o Landslide: Low				
	 Invasive Species: Low 				
	 Hazardous Materials: Low 				
	 Flood: High 				
	o Extreme Temperature: Medium				
	o Earthquake: Low				
	 Drought: Medium 				
	 Disease Outbreak: Low 				
	 The County-wide rankings are as follows: 				
	impacts.				
	up to a high ranking based on current conditions and recent				
	 The Steering Committee agreed that flood should be moved 				
	noted that the hazard ranking calculation has been updated but local conditions can warrant adjustments.				
	how flooding is being evaluated for this update. Mr. Huch				
	risk hazard and asked if there was a different calculation for				
	 Mr. Sansone noted that in previous plans, flooding was high risk based and asked if there was a different calculation for 				
	considered for FIRMs such as urban flooding.				
	includes a variety of flooding including flooding not				
	FIRMs have specific language for flooding but the HMP				
	changes coming down the pipeline? Mr. Huch explained that				
	remapping FIRMS, does the hazard ranking reflect the				
	 Mr. Chung noted FEMA is reclassifying what 'flood' means for 				
	 Flood – 				
	instead of high				
	The Steering Committee felt extreme temp could stay at medium				
5	 Risk Ranking Summary Extreme Temperature (Heat/Cold) – ranked medium on 2020 CEPA. 				
5	is from 2008. Flood risk overall in the future is likely to increase				
	disaster declarations. Working to get updated NFIP data, current data				
	 Flooding – medium – HAZUS – model potential impacts – four major 				
	economy and building damage.				
	extreme heat events (urban Heat Island) Medium ranking is based on				
	and extreme cold < 0 degrees. Urban areas more susceptible to				
	 Extreme Temp(Heat/Cold) – Medium – extreme heat >10 degrees 				
	soil areas D & E.				
	shaking – 59% of population and 57% of building stock is in NEHRP				
	 Earthquake – Low –Soil in the region will have a greater chance of shaking – 59% of population and 57% of building stock is in NEHRP 				









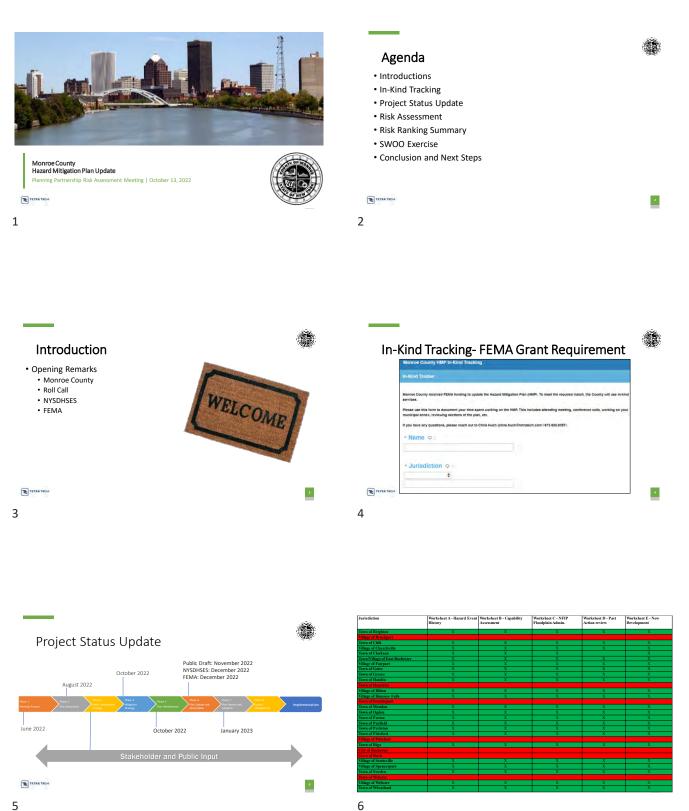
Planning Partnership Risk Assessment Meeting

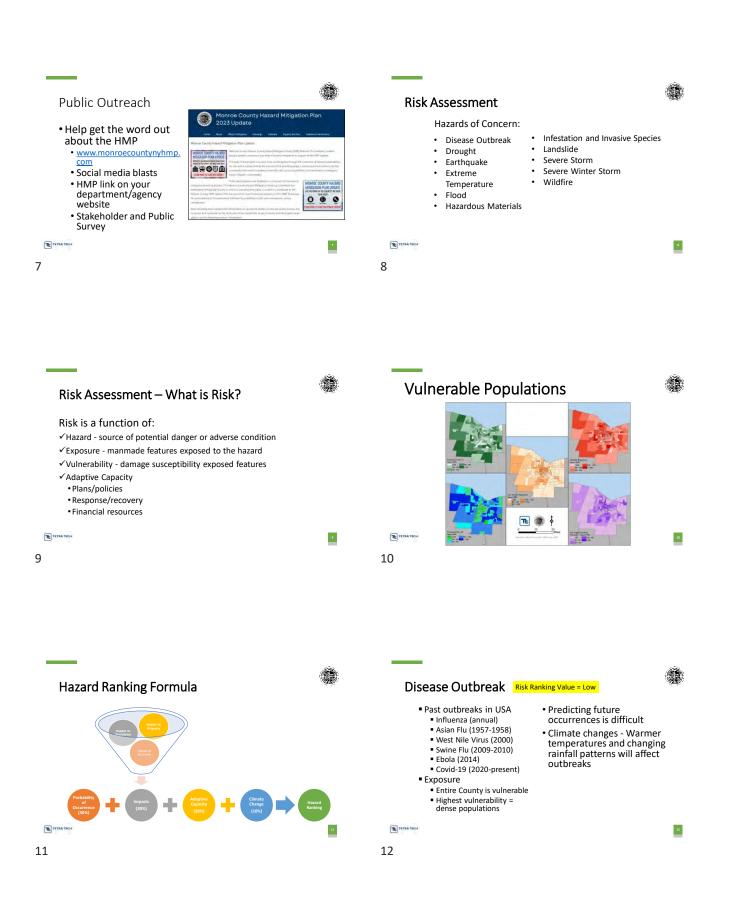
Join Zoom Meeting

https://monroecounty-gov.zoom.us/j/89783108957?pwd=QjhXOU9tRDMrbE9ZRW1zbGJLbjRyZz09

Meeting ID: 897 8310 8957 Passcode: 46014449 One tap mobile +16469313860,,89783108957#,,,,*46014449# US +16468769923,,89783108957#,,,,*46014449# US (New York)

- Welcome and Introductions
- In-Kind Tracking
- Project Status Update
- Risk Assessment
- Risk Ranking Summary
- Hazards of Concern Exercise
- SWOO Exercise: https://www.surveymonkey.com/r/MonroeSWOO
- Conclusion and Next Steps



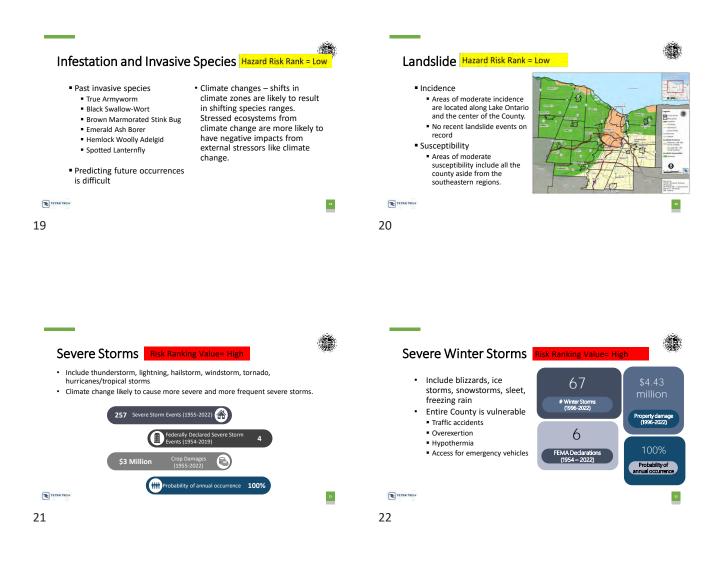


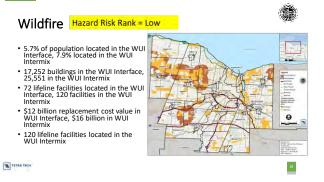












Risk Ranking Summary - Countywide 0.6 0.3 0 Has 0.3 0.1 0.6 0.3 0.9 4.5 -0.3 0.2 Wildfir 0.6 0.2 TE TETRA TECH











Purpose of Meeting:		Planning Partnership Risk Assessment Meeting		
Location of Meeting:		Teleconference Teams Meeting		
Date of Meeting:		October 13, 2022 11:00am – 12:00pm		
Atten	dees:			
ç	See Participation Matrix			
Agend	da Summary:			
ltem No.		Description	Action item(s):	
1	Welcome and Introductions Meeting started at 10:00 am			
2		eminded to fill out the in-kind tracking form for outside of meetings	 In-kind tracker will be sent out by Tt via email 	
3	 Project Status Update Project timeline is Mitigation Strates The draft plan will 		 Mitigation Strategy Workshop – Monday, 10/24 10am 	
4	 Risk Assessment Each hazard of concern has a stand alone hazard profile Climate change is a new requirement for HMPs and included in the risk assessment Adaptive capacity is included in risk rankings as well. 		 Continue to work with FEMA to obtain updated NFIP data 	
5	extreme tempera to high. • The County-wide	ke: Low Temperature: Medium gh s Materials: Low pecies: Low : Low : Low orm: High inter Storm: High		





	 Municipalities will receive their municipal specific risk rankings in a worksheet and are asked to provide feedback and modify according to local conditions. 	
6	 SWOO Exercise Planning Partnership to complete a SWOO. https://www.surveymonkey.com/r/MonroeSWOO 	 Request will be sent out via email Submit SWOO by end of week
7	Conclusion - The meeting concluded at 11:00 am	N/A



MONROE COUNTY HAZARD MITIGATION PLAN UPDATE MITIGATION STRATEGY WORKSHOP – AGENDA MEETING DATE/TIME: October 17, 2022 – 11:00 am



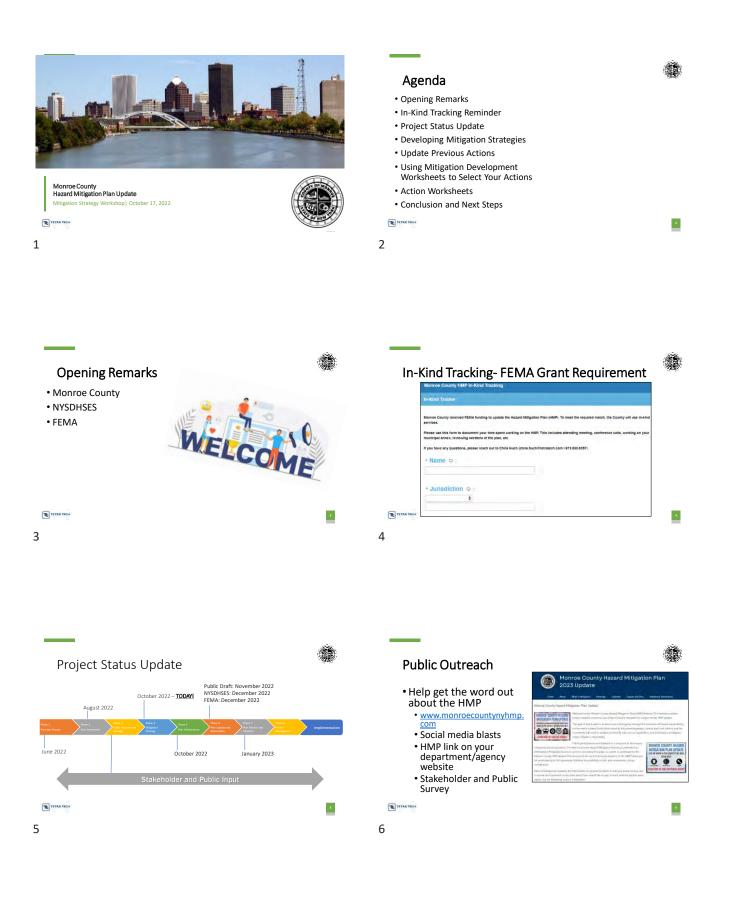
Mitigation Strategy Workshop

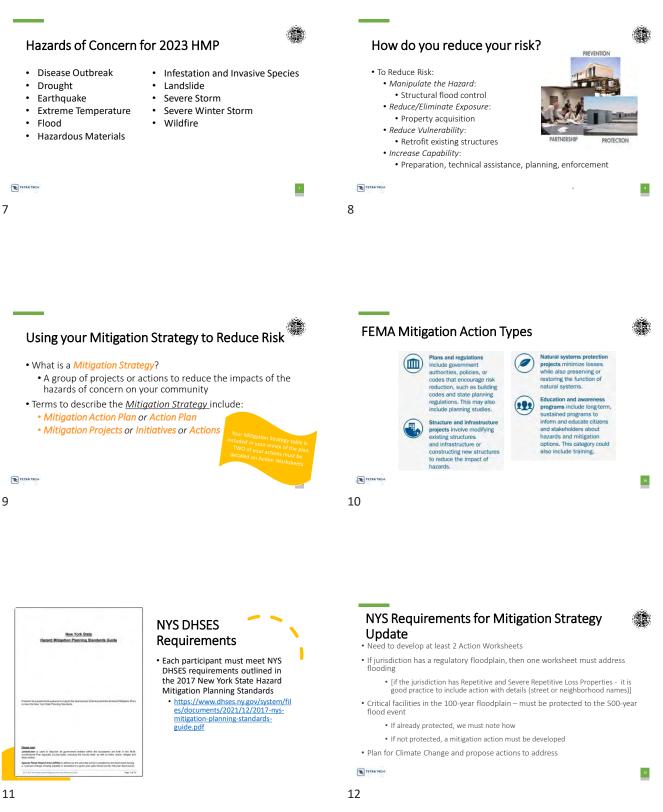
Join Zoom Meeting

<u>https://monroecounty-</u> gov.zoom.us/j/81775748666?pwd=YjJOZ1BMRFhKQkp2U0ZhZkpSWU5HUT09

> Meeting ID: 817 7574 8666 Passcode: 01887469 One tap mobile +16468769923,,81775748666#,,,,*01887469# US (New York) +16469313860,,81775748666#,,,,*01887469# US

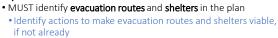
- Welcome and Introductions
- In-Kind Tracking Reminder
- Project Status Update
- Developing Mitigation Strategies
- Updating Previous Actions
- Using Mitigation Development Worksheets to Select Your Actions
- Action Worksheets
- Conclusion and Next Steps





14

NYS Requirements for Mitigation Strategy Update



- MUST identify **temporary housing** and **permanent housing** locations in the plan
- Identify actions to develop these locations, even if outside of jurisdictional boundaries

TETRA TECH		13	
3			

NYS Requirements for Mitigation Strategy Update	
Opdate	

- Proposed actions MUST have specific information identified including:
 - Project lead
 - Estimated cost
 - Timeline

TE TETRA TECH

14

13

- · Whether the action involves a critical facility
- All required items are identified within the proposed action table. <u>Each</u> <u>cell of the table MUST be filled out!</u>

Connecting to the Mit	igation Strategy	(The roadmap to
 Need a clear connection between vulnerability and proposed mitigation actions. Capability assessment provides insight into challenges/opportunities for the mitigation strategy as well. Provides the factual basis for activities proposed in the mitigation strategy. 	Capability Assessment Risk Assessment Kisk Assessment Kisk Capability Assessment Kisk Capability Assessment	Problem Areas in Community NYS Requirements	Hazards of Concern: High Ranked Hazards
тато: 15		15	16



Update the Mitigation Strategy

· Areas that have been impacted by hazard events

· Critical/Lifeline facilities in the floodplain

· Evacuation routes and sheltering needs

RL/SRL properties need mitigating

• Start with Problems (many identified on your Problem Statement

• Review our Goals and Objectives

Worksheets)

· Recurring issues

What are we focusing on for the mitigation strategy?

- Stronger connection between the risk assessment and mitigation strategy
- More specific actions
- Specific projects, in specific locations, in a specific timeframe
- Diverse actions
 - Focus on highest ranked hazards but also look to address other hazards
 - Include a variety in the types of actions

TE TETRA TECH

17

18

18 TE TETRA TECH

28

Update the Mitigation Strategy

- Identify New Mitigation Actions/Projects
- Modify 'Carry-Over' projects from the previous HMP -more specific or address different aspect of original problem







Why we must update our actions...

- Actions in the previous plan often were general and did not include detailed information.
- Detailed information is needed to support FEMA grant applications for funding support.
- Focus on updating previous actions to include the necessary level of detailed information.
- If detailed information is not available, note a phase in the action that will gather this information such as an engineering study or feasibility assessment.
- Use the same level of detail for new actions as well!

TE TETRA TECH

21



and action



Problem: Critical facilities require backup power.

• Solution: Acquire backup power for critical facilities.

Example: Previous problem and action

Example: Improved problem and action



 Problem: Town Hall lacks a backup power source. The Town Hall houses the Emergency Operations Center and also can serve as a backup shelter. Lack of power results in a breakdown of continuity of operations and prevents the Town Hall from providing critical services during a hazard event.

 Solution: The Town Engineer will work with the Office of Emergency Management to research and purchase the appropriately sized backup generator for the Town Hall. The DPW will install the backup generator and necessary electrical components and will be responsible for testing and upkeep of the generator after installation.

TE TETRA TECH





TE TETRA TECH

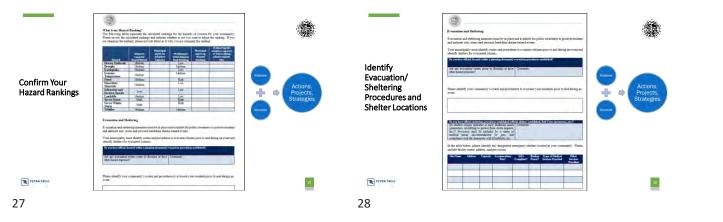
Example: EVEN MORE Improved problem

24

- Problem: Town Hall lacks a backup power source. The Town Hall houses the Emergency Operations Center and also can serve as a backup shelter for approximately 100 people. Lack of power results in a breakdown of continuity of operations and prevents the Town Hall from providing critical services during a hazard event.
- Solution: The Town Engineer will work with the Office of Emergency Management to
 research and purchase a 75 kW generator for the Town Hall. The DPW will install the
 backup generator on the roof of the Town Hall and necessary electrical components
 and will be responsible for testing and upkeep of the generator after installation.



-How to Fill Out Your Mitigation Strategy Worksheet and the opposite The degree affect firm distance change will one based on best 25



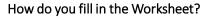


How do you fill in the Worksheet?

The worksheet asks a series of questions to help you think about vulnerabilities within your community.

- Critical Facilities/Lifelines backup power
- Critical Facilities/Lifelines flood protection
- Culverts undersized/in need of upgrades
- Flood Protection elevations/buyouts; think about the RL/SRL properties if you have RL/SRLs you need an action related to this
- Infrastructure Protection what needs protection from flooding, storms, etc.?
- Anything else?

TE TETRA TECH		
31		



- Review the pre-populated information on your worksheet
- Information from worksheets submitted to date
- Input from public/stakeholder surveys
- Risk assessment resultsDetermine the problems that you will pursue solutions for
- Add as much detail as possible to the problems and develop detailed solutions
- Return worksheet to Chris Huch at Tetra Tech by this Wednesday, October 18 for discussion during your annex development meeting

We will schedule meetings this week







34



Action Worksheets



- Each jurisdiction must develop at least 2 Action Worksheets
- Should also develop additional Action Worksheets for projects you plan to apply for FEMA funding support for within the next 5 years
- Not every action requires an Action Worksheet to be developed but the same sort of information about those actions are still needed in the Proposed Actions table of the annex
- If jurisdiction has a regulatory floodplain then one worksheet must address flooding
- Critical facilities in the 100-year floodplain must be protected to the 500-year flood event
- Plan for Climate Change and propose actions to address

TE TETRA TECH

36

Action Worksheet

- Description of the Problem
- What is the problem?
- What is the risk?
- · Where is the problem
- occurring?

TE TETRA TECH

37

- Who is the problem impacting? Have there been past
- damages? How frequently does the problem occur?



Action Worksheet

- Description of the Solution How do you propose to solve or mitigate the problem?
- What are the design
- specifications?
- Height and length of a floodwall
 kW for backup generators
 Number of structures to be bought
- out or elevated • Etc.
- · Who is responsible for what aspects of the project?

TE TETRA TECH

38



Action Worksheet

Level of Protection

- · What level event is the project being designed to protect to? For flood protection: 100-year
- flood, 500-year flood
- For stormwater improvements: 5 year, 10 year rain events
- If not a specific level, include brief description of what protections are
- For generators: Prevents power loss



39



Action Worksheet

Estimated cost

- What will the project cost?
- · If project includes phases or components, what will each phase or component cost?
 - New generator: \$25K, elevation platform for generator: \$1K

40



Action Worksheet

Estimated Benefits

- Provide a description of the estimated benefits, either quantitative and/or qualitative
- · Identify the benefits that implementation will provide. If dollar amounts are known, include them. If dollar amounts are unknown, describe the losses that will be avoided. 41 TE TETRA TECH





Action Worksheet

- Prioritization
 - High, Medium, or Low
- Use the second page of Action Worksheet to evaluate each action and assist in the determination of priority (to be discussed shortly)

42 TE TETRA TECH



Action Worksheet

- Responsible Organization
 - Identify the lead organization/department/individ ual for the project
 - Identify any supporting organizations/departments/ individuals for the project.



Action Worksheet

- Estimated Time Required for Project Implementation
 - Provide the estimated time required to complete the project from start to finish.



43

43 TE TETRA TECH

Action Worksheet

Alternatives

- Three alternatives are needed for each action worksheet.
 - 1st alternative can be no action
 - 2nd and 3rd alternatives include estimate cost and a description of the pros/cons of the alternatives

45 TE TETRA TECH



45



Evaluation of Actions

- · Consider the benefits and costs
- Consider the implementation timeline
- · Consider the areas/problems of greatest need
- Consider the funding sources
- High/Medium/Low priority 1 = highlight effective or feasible

0 = neutral -1 = ineffective or not feasible

TE TETRA TECH

44

46





Schedule



- Complete Mitigation Development Worksheet and return to Chris Huch at Tetra Tech Planner Before October 19th.
- Work with Tetra Tech Planner to Complete Actions and Annex following meeting
- Draft Plan to Steering Committee by middle of November
- Final draft plan to NYS DHSES and FEMA December 2022











Purpose of N	leeting:	Mitigation Strategy Workshop	
Location of Meeting: Teleconference Zoom Meeting		Teleconference Zoom Meeting	
Date of Mee	Date of Meeting: October 17, 2022 11:00 am – 12:00 pm		
Attendees: See Par Agenda Sum	rticipation Matrix mary :		
ltem No.		Description	Action item(s):
1 Welc • • 2 Deve •	The meeting starter Matt Jarrett thanka participating in the Mr. Huch welcome the meeting, which process and develor to each municipalit Paul Hoole from FE were present from Ioping Mitigation Stra Mr. Huch revieweo drought, Earthqual Materials, Infestati Severe Winter stor risk reduction. Mr. Huch then revi mitigation strategy explained what a n Each jurisdiction w © Each jurisd Worksheet © If the jurisd must addra © Repetitive action with © Critical fac floodplain (0.2% annu © Plan for cli © Evacuation	ed participants for attending the meeting and planning process. d attendees. Mr. Huch described the purpose of a was to review the hazard mitigation planning op mitigation strategies. A worksheet was emailed by to work off of during the meeting. MA, and Roland Paperman and Shannon Clarke DHSES. Integies the 2023 hazards of concern (Disease Outbreak, ke, Extreme Temperature, Flood, Hazardous on and Invasive species, landslide, Severe storm, m, Wildfire) and discussed different methods of ewed the NYS requirements for updating the as well as FEMA Mitigation Action Types and hitigation strategy is. ill need to meet the following requirements: iction must develop at least two Action	





3	 Proposed actions must have specific information when discussing the problem and solution and identify information such as: Project lead Estimated cost Timeline Whether the action involves a critical facility All required items are identified within the proposed action table. Each cell of table MUST be filled out Mr. Huch explained that mitigation actions must have a clear connection to the risk and capability assessments. Mr. Huch reviewed the types of mitigation actions that should be considered: Structure and Infrastructure Projects Local Plans and Regulations Natural Systems Protection Projects Education and Awareness Programs Mr. Huch explained to participants that carryover actions must be updated to be made more specific and more diverse. Mr. Huch provided examples on how to update carryover actions to meet the current standards of the HMP planning process. Mitigation Action Development Worksheet Mr. Huch explained how participants should fill out the Mitigation Action Development Worksheet. The worksheet is designed to gather as much information as possible from municipal participants so Tetra Tech planners can develop mitigation actions for municipal review and input. The worksheet is to be filled out and returned to Tetra Tech after the municipality completes it. Municipalities should emphasize quality over quantity. Mr. Huch reviewed the proposed action table and action worksheet and detailed the information necessary to complete each. Mr. Huch 	 Municipalities should return their Mitigation Action Development Worksheet in once week. Tetra Tech will set up small group meetings with municipalities to identify additional actions and complete
	reviewed how municipal representatives should make use of problem statements emailed to them by their Tetra Tech planners, identify additional problem areas, and brainstorm potential mitigation actions.	their annexes
4	Comments	
	 Paul Hoole from FEMA: Grant applications must be submitted by end of January, so FEMA approving HMP is important. Adopt plan before we wait for FEMA approval, getting plan adopted sooner in January is crucial in getting funding, so adopting it sooner will benefit jurisdictions. 	
	 Steve Schultz: In terms of streams, many overflow banks and damage is hard to quantify. How do we characterize how we will mitigate it and display that on the worksheet? Difficulty putting a dollar sign to specific mitigation practices. Mr. Huch noted that municipalities can 	





	 note "we will have a study and do this" or "this is what we are assuming based off of the information we know." and include several phases. Mr. Huch emphasizes that DHSHES and FEMA are the HMP reviewers, but they are also partners, and to include them in questions and concerns about projects.
9	Conclusion
	• The meeting ended at 12:00pm.





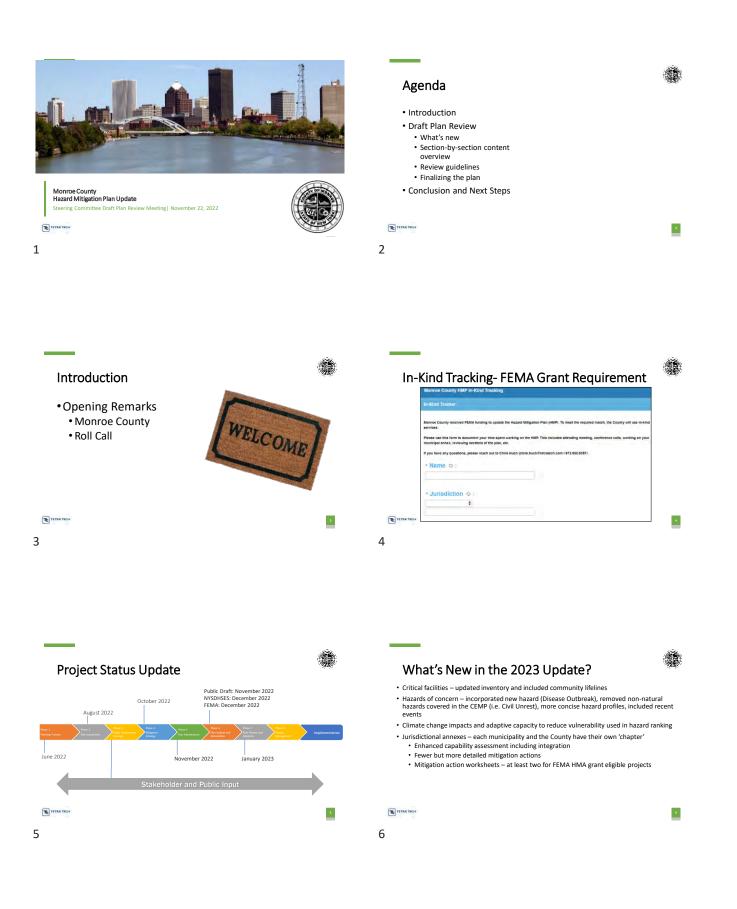
Steering Committee Draft Plan Review Meeting

Join Zoom Meeting

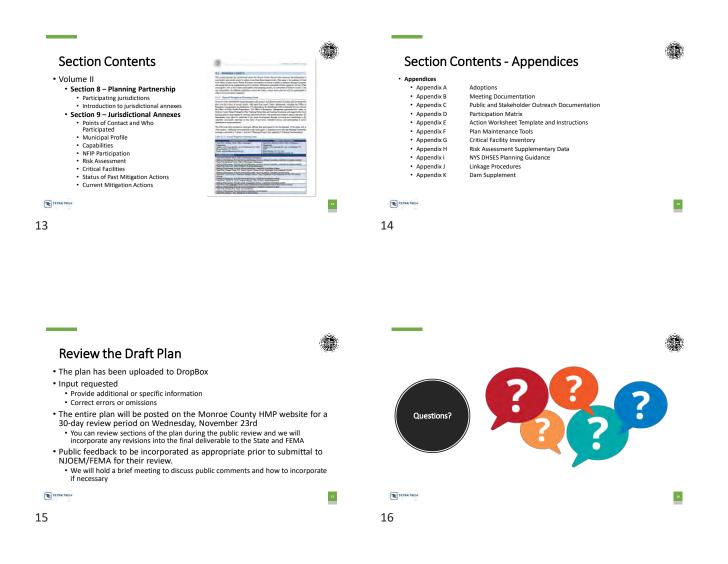
https://monroecounty-gov.zoom.us/j/88938098607?pwd=eWxiYTB5c2o5R3FJUkl1VmJmZHpVdz09

Meeting ID: 889 3809 8607 Passcode: 03061146 One tap mobile +16469313860,,88938098607#,,,,*03061146# US +16468769923,,88938098607#,,,,*03061146# US (New York)

- Welcome and Introductions
- Draft Plan Review
 - o What's new
 - o Section-by-section content overview
 - o Review guidelines
 - o Finalizing the plan
- Conclusion and Next Steps













Purpose of Meeting:	Steering Committee Draft Plan Review Meeting				
Location of Meeting:	Teleconference Teams Meeting				
Date of Meeting:	November 22, 2022 1:00pm – 2:00pm				
Attendees:					
Timothy Henry, Monroe County C	Office of Emergency Management				
Matthew Jarrett, Monroe County Office of Emergency Management					
Elisabeth Clower, Monroe County Office of Emergency Management					
Clement Chung, Monroe County Department of Environmental Services, Deputy Director					
Andrew Sansone, Monroe County Department of Environmental Services					
Rochelle Bell, Monroe County Department of Planning and Development, Senior Associate Planner					
Kelly Emerick, Monroe County Soil & Water Conservation District, Executive Director					
Scott McCarty, Monroe County DES-GIS Services Division, Operations Manager					

- Scott McCarty, Monroe County DES-GIS Services Division, Operations Manager
- Chris Huch, Tetra Tech, Project Manager
- Lt. Sam Hillman, Monroe Community College, Public Safety
- David Inzana, Hilton Central School District
- Sarah Ruekberg, City of Rochester Fire Department
- Jamie Renner, City of Rochester Fire Department, Captain
- Erin Magee, Irondequoit DPW, Deputy Commissioner

Agenda Summary:

ltem No.	Description	Action item(s):
1	Welcome and Introductions	
	 Meeting started at 1:00 pm 	
2	In-Kind Tracking	 In-kind tracker will be
	 Attendees were reminded to fill out the in-kind tracking form for work completed outside of meetings 	sent out by Tt via email
3	 Draft Plan Review Mr. Huch discussed the updates present in the 2023 plan: Critical facilities – updated inventory and included community lifelines Hazards of concern – incorporated new hazard (Disease Outbreak), removed non-natural hazards covered in the CEMP (i.e. Civil Unrest), more concise hazard profiles, included recent events Climate change impacts and adaptive capacity to reduce vulnerability used in hazard ranking Jurisdictional annexes – each municipality and the County have their own 'chapter' Enhanced capability assessment including integration Fewer but more detailed mitigation actions Mitigation action worksheets – at least two for FEMA HMA grant eligible projects 	 Steering Committee members to review plan sections as they are able to and send feedback to Tetra Tech. Tetra Tech to post plan for public review and provide language for publicizing the posting.





•	Mr. Hi	uch ran through the sections of the HMP:	
	0		
	Ū	 Mitigation planning overview 	
		 Participating jurisdictions 	
		 2023 updates and summary of changes since last 	
		plan	
	0	Section 2 – Plan Adoption	
	0	Section 3 – Planning Process	
		 Plan participants (committees, stakeholders, etc.) 	
		 Activities 	
		 Ongoing process 	
	0	Section 4 – County Profile	
		 History & Physical Setting 	
		 Major Hazard Event History 	
		 Population and Demographics 	
		 General Building Stock 	
		 Land Use and Population Trends 	
		 Critical Facilities & Lifelines 	
	0	Section 5 – Risk Assessment	
		 Hazards of concern 	
		 Hazard ranking 	
		Hazard profiles	
	0	Section 6 – Capability Assessment	
		 Capability Assessment Available plans, programs, & recourses 	
		 Available plans, programs, & resources Administrative and technical canabilities 	
		 Administrative and technical capabilities Eiscal capabilities 	
		Fiscal capabilities	
		 Plan integration Mitigation Strategies 	
		Past accomplishments	
		 Goals and Objectives 	
		 Mitigation strategy development and update 	
		 Action identification 	
		Evaluation and prioritization	
		 Benefit/cost review 	
	0	Section 7 – Plan Maintenance	
	0	 HMP Coordinator 	
		 Ongoing Planning Partnership – meet annually to 	
		discuss HMP	
		 Monitoring 	
		 Continuous evaluation and progress reports 	
		■ FEMA action worksheets and BATool [™]	
		 Updating 	
		 Integrating the HMP with existing and future 	
		programs	
		 Continued public involvement 	



ſ	l	ſ	
L			J

r		
	 Section 8 – Planning Partnership 	
	 Participating jurisdictions 	
	 Introduction to jurisdictional annexes 	
	 Section 9 – Jurisdictional Annexes 	
	 Points of Contact and Who Participated 	
	 Municipal Profile 	
	 Capabilities 	
	 NFIP Participation 	
	 Risk Assessment 	
	 Critical Facilities 	
	 Status of Past Mitigation Actions 	
	 Current Mitigation Actions 	
	 Appendix A Adoptions 	
	 Appendix B Meeting Documentation 	
	 Appendix C Public and Stakeholder Outreach 	
	Documentation	
	 Appendix D Participation Matrix 	
	• Appendix E Action Worksheet Template and Instructions	
	 Appendix F Plan Maintenance Tools 	
	 Appendix G Critical Facility Inventory 	
	 Appendix H Risk Assessment Supplementary Data 	
	 Appendix I NYS DHSES Planning Guidance 	
	 Appendix J Linkage Procedures 	
	 Appendix K Dam Supplement 	
	• Mr. Huch reminded the Steering Committee that the plan has been	
	uploaded to DropBox. The Committee is requested to provide input	
	by providing additional or specific information and helping correct	
	errors or omissions.	
	• The entire plan will be posted on the Monroe County HMP website	
	for a 30-day review period on Wednesday, November 23 rd . The	
	County and municipalities will post on their websites and social	
	media to announce the posting of the plan.	
	• The Steering Committee can review sections of the plan during the	
	public review. Tetra Tech will incorporate any revisions into the final	
	deliverable to the State and FEMA. Public feedback to be	
	incorporated as appropriate prior to submittal to NYSDHSES/FEMA	
	for their review. The Committee will hold a brief meeting as	
	necessary to discuss public comments and how to incorporate if	
	necessary.	
4	Questions	
	Mr. Sansone asked the process for adoption. Mr. Huch explained that	
	municipalities will have a year to adopt but the push will be to do so	
	within the first few months.	
	 Mr. Chung asked if the HMP would be represented at the FEMA FIRM 	
	Open House. Mr. Huch explained that there will be information	
	available at the Open House (handout and QR code link to the HMP	
	website).	

	Monroe County Hazard Mitigation Plan Update Meeting Notes	T
	 Mr. Sansone asked what the maintenance procedures are for the HMP. Mr. Huch briefly presented on the BATool which will provide an electronic platform for reporting on progress of actions. Each municipality will have log in information to report on their actions. The County will have access to all municipal data. Mr. Jarrett asked for an update on NFIP data request to FEMA. Mr. Huch responded that the data request is being processed by FEMA but the timeline for delivery is still unknown. Mr. Huch suggested that the determination of if and how to use the data should be dependent on the date the data is received. Mr. Jarrett agreed with this assessment. 	
7	Conclusion - The meeting concluded at 1:50 pm	



APPENDIX C. PUBLIC AND STAKEHOLDER OUTREACH

This appendix provides documentation of public and stakeholder outreach. Stakeholder involvement in this planning process was broad and productive as discussed and further documented in Section 3 (Planning Process). Public and stakeholder input has been incorporated throughout this HMP as appropriate, as identified in Section 3 and the References section, as well as within specific mitigation initiatives identified within the jurisdictional annexes (Section 9). Respondent feedback filtered by jurisdiction is included in each jurisdictional annex as available to provide an indication of community resident concerns related to natural hazards.

C.1 Monroe County Citizen Survey Results

This section contains information and results gathered from the Monroe County Citizen Survey. The main objective of this survey was to gather information from citizens regarding their level of knowledge regarding hazard vulnerability and knowledge of hazard mitigation information for their local communities. Roughly 100 respondents completed this survey over a period of four months during the planning process. The survey was available on Monroe County website and the HMP website at: <u>https://www.monroecountynyhmp.com/</u>. The survey results are provided in the following pages, with personal information redacted.





C.2 Stakeholder Surveys

In addition to collecting information from residents of Monroe County, surveys were developed for the agencies and stakeholders in the County. Unlike steering committee or planning partnership members, stakeholders may not be involved in all stages of the planning process, but they may have information or input to provide. In order to gather that information, the surveys were sent to the following stakeholders: law enforcement, firefighters, emergency medical services, highway and public works, business and commerce, hospitals and health care providers, and utilities. Results of the surveys are provided in the following pages, with personal information redacted.





C.3 Neighboring County Survey

A neighboring county survey was sent to the surrounding counties of Monroe due to their proximity to the County and because the effects of hazard events that impact Monroe County would be similar to that of their neighbors. A summary of the results are included on the following pages.





C.4 Website and Social Media Posts

The following provides screenshots of websites, news articles, and social media posts

Figure C-1. Monroe County OEM Survey and October Meetings Facebook post

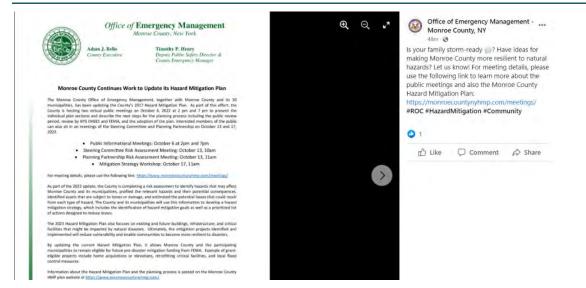


Figure C-2. Monroe County OEM Survey and October Meetings Facebook post







Figure C-3. Monroe County Soil & Water Conservation District Public Survey Facebook Post

-	Monroe Coun 2m · 🕤	ty Soil & Water Conservati	on District
Miti We	gation Plan to add need to hear from	ne rain! Monroe County is u dress hazards like flooding n you to help us make the C ete a survey about natural	in Monroe County. County a safer place!
	VEYMONKEY.COM	azard Mitigation Plan -	Public Survey
	🖒 Like	Comment	A Share









Figure C-5. Town of Perinton Facebook post and Survey Link



Figure C-6. Town of Perinton Instagram post and Survey Link

townofperinton Fairport, New York	1
HONROE COU MITICATION P REPRESENT AN ORGANIZ WORKS IN THE COUNTY?	ATION OR GROUP THAT WE NEED YOUR HELP!
$\bigcirc \bigcirc \bigcirc \blacksquare$	
townofperinton Don't get caught in the ra Hazard Mitigation Plan to address hazard participating communities to be eligible f Your feedback will help ensure that crucic Perinton and communities across the cou You are encouraged to take the citizen pr www.surveymonkey.com/r/3ZQ2VFX (lin The survey includes the topics such as pr ideas and projects to improve resilience.	Is such as flooding. This plan enables or federal funding if disaster strikes. I mitigation projects can happen in unty. eparedness survey found here k in stories).
Please visit 🔜 www.monroecountynyhm	p.com for more information.





Figure C-7. Town of Perinton Twitter post and Survey Link



Please visit
monroecountynyhmp.com for more information.



Home - Monroe County Hazard Mitigation Plan 4:54 PM · 17 Oct 22 from Fairport, NY · Twitter for Android

Figure C-8. Public Notice of Public Meetings

NOTICE OF PUBLIC MEETING

Date and Time(s): October 6th, 2022 at 2PM & 7PM

at 2PM & 7	PM		1000
Meeting L	ocation: N	Monroe	County
Office of	Emergency	Mana	gement,
Emergency			
Scottsville		Suite	#200.
Rochester, 1	VY 14624		1000
ZOOM	link:		2PM:
https://moni		gov.2001	m.us/j/8
3942435225	i		

Dial In: 646-931-3860 Meeting ID: 83942435225 7 P M :

7 P M : https://monroecounty-gov.zoom.us/j/8 4528439089

Dial In: 646-931-3860 Meeting ID: 84528439089

All Monroe County, NY residents are invited to attend a Public Meeting hosted by the Monroe County Hazard Mitigation Plan Steering Committee, its staff and consultants to assist and contribute in updating the 2023 Hazard Mitigation Plan for Monroe County and its thirty municipalities. The 2023 Hazard Mitigation Plan focuses on existing and future buildings, infrastructure, and critical facilities that could be impacted by natural disasters. The mitigation projects identified and implemented will reduce vulnerability and enable communities to become more resilient to disasters.

The update to the Hazard Mitigation Plan will allow the County and participating jurisdictions to continue to be eligible for future pre-disaster mitigation funding from FEMA. For more information about the Hazard Mitigation Plan, please go to the Monroe County HMP plan website at <u>monroecountynyhmp.com</u>. 21257178 9-23-1t





Figure C-9. Town of Chili Website and Survey Link







Figure C-10. Town of Ogden Website and Survey Link



Figure C-11. Town of Penfield Facebook post and Survey Link

Penfield Town Superviso September 20 at 10:58 AM · 🕲		
	its Hazard Mitigation Plan and war lay a part in the planning process.	
	igation Plan - Public Survey	
terri en net net net tre	igation Plan - Public Survey	A Share
		A Share





Figure C-12. Town of Perinton Instagram Story and Survey Link



Monroe County Hazard Mitigation Plan Update



Mitigation Plan (HMP) Website. This website provides project updates, resources, and links to hazard mitigation in support of the HMP update.

The goal of the project is to save lives and property through the reduction of hazard vulnerability for the entire county. During the course of this planning project county

Figure C-13. Town of Parma Website

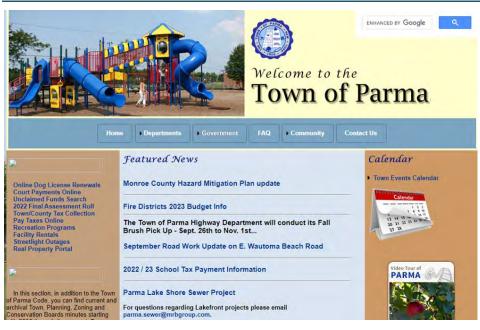






Figure C-14. Village of Fairport Instagram post and Survey Link



Figure C-15. Village of Fairport Facebook post and Survey Link



Figure C-16. Village of Fairport Twitter post and Survey Link



11:13 AM · Sep 16, 2022 · Twitter Web App





Figure C-17. Village of Spencerport Website and Survey Link



Spencerport HOME COMMUNITY DEPARTMENTS GOVERNMENT

Latest News

A Message from Monroe County Department of Emergency Preparedness

Is your family storm-ready? Have ideas for making Monroe County more resilient to natural hazards? Let us know! We are updating the County's Hazard Mitigation Plan and are looking for your feedback to inform our planning process.

Take our survey to contribute your knowledge:

https://www.surveymonkey.com/r/3ZQ2VFX

Figure C-18. Village of Webster Website and Survey Link



Figure C-19. Town of Webster Facebook post and Survey Link







Figure C-20. Town of Webster Website and Survey Link

Monroe County Hazard Mitigation Plan Update:

The goal of the project is to save lives and property through the reduction of hazard vulnerability for the entire county. During the course of this planning project, county and local leaders and the community will work in tandem to identify risks, assess capabilities, and formulate a strategy to reduce disaster vulnerability.

The Monroe County Hazard Mitigation Steering Committee has developed a Mitigation Survey to assist in providing the public an outlet to contribute to the Monroe County HMP update.

Take the Survey

Monroe County Website



Figure C-20. Town of Brighton Draft Plan Website Posting

Bright		00
IONROE COUNTY, NE	Departments Services	Town Code
ALC: NO DE CONTRACTOR		STATE NO.
Brighton Police	Home > News Flash	
Recreation & Parks	Home	Search
Annual Budget Documents Brighton Veterans Memorial	Posted on: November 30, 2022 The Monroe County Hazard Mitigation Plan 2023 Update is now ready for p review	All categories
Citizen Boards & Commissions	The projects and information included in the HMP allow your communities to become eligible for gran funding opportunities to minimize losses from natural disasters. The Public Review Period is open ur	Tools
Envision Brighton"	December 23 so don't miss this last chance to have your voice be heard! Your support and response greatly appreciated! Click here for more information and to review the plan:	All Categories
mployment	https://www.monroecountynyhmp.com/	Home 2022 Redesign
ireen Brighton	Additional Info	
Leaf and Yard Debris Collection	fym	





Figure C-20. Town of Chili Draft Plan Website Posting

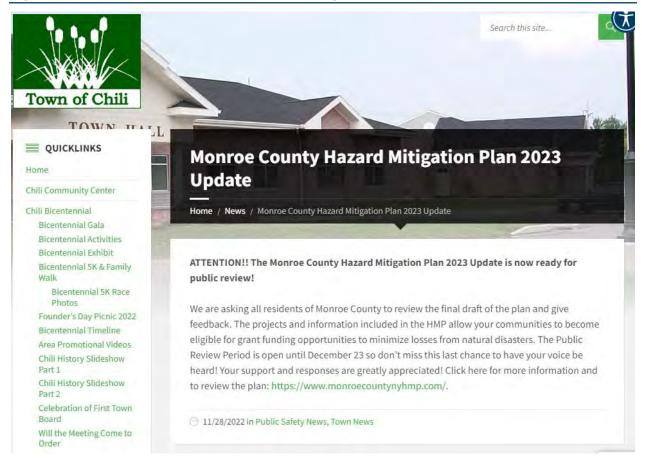






Figure C-20. Hilton Parma Recreation Draft Plan Facebook Posting



Hilton Parma Recreation

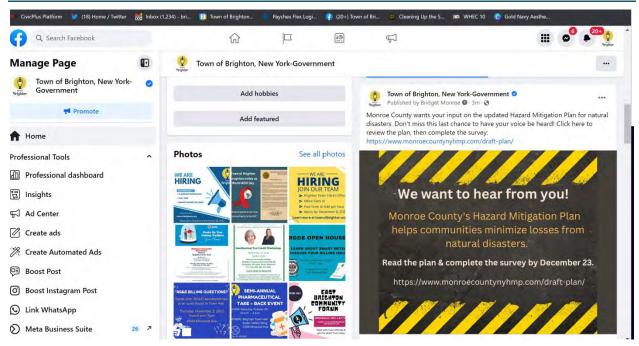
23h · 🕄

Announcement from Monroe County: The Monroe County Hazard Mitigation Plan 2023 Update is now ready for public review!

They are asking all residents of Monroe County to review the final draft of the plan and provide feedback. The projects and information included in the HMP allow your communities to become eligible for grant funding opportunities to minimize losses from natural disasters. The Public Review Period is open until December 23 so don't miss this last chance to ha... **See more**



Figure C-20. Town of Brighton Draft Plan Facebook Posting







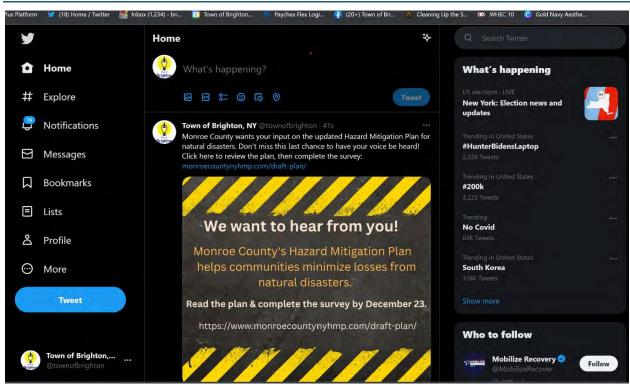


Figure C-20. Town of Brighton Draft Plan Facebook Posting

Figure C-20. Village of Spencerport Draft Plan Website Posting



Spencerport

"Someplace Special"

HOME COMMUNITY DEPARTMENTS GOVERNMENT

V

ATTENTION !! The Monroe County Hazard Mitigation Plan 2023 Update is now ready for public review!

We are asking all residents of Monroe County to review the final draft of the plan and give feedback. The projects and information included in the HMP allow your communities to become eligible for grant funding opportunities to minimize losses from natural disasters. The Public Review Period is open until December 23 so don't miss this last chance to have your voice be heard! Your support and responses are greatly appreciated! Click here for more information and to review the plan: https://www.monroecountynyhmp.com/.





Figure C-20. Monroe County Office of Emergency Management Draft Plan Facebook Posting



Office of Emergency Management - Monroe County, NY Favorites - December 5 at 2:41 PM - 🕤

The Monroe County, NY Hazard Mitigation Plan 2023 Update is now ready for public review!

We are asking all residents of Monroe County, NY to review the final draft of the plan and give feedback. The projects and information included in the HMP allow your communities to become eligible for grant funding opportunities to minimize losses from natural disasters. The Public Review Period is open until December 23rd so don't miss this last chance to have your voice be heard! Your support and responses are greatly appreciated! Click here for more information and to review the plan:

https://www.monroecountynyhmp.com/,

#ROC #HazardMitigation







APPENDIX D. PARTICIPATION MATRIX

The matrix in Appendix D is intended to give a broad overview of FEMA, New York State, County, municipal and stakeholder personnel that participated in the Monroe County HMP update planning process. Meeting attendees and input provided are also included. All participants were encouraged to attend the kick-off meeting, risk assessment meeting, and mitigation strategy workshop. Participants unable to attend a Steering Committee and Planning Partnership meeting were provided access to meeting recordings and materials. During the planning process the consultant contacted each participant to offer support, explain the process, and facilitate the submittal and review of critical documents.

Letters of Intent to Participate indicating municipal planning efforts are included in this appendix. Participation is defined as having input to the hazard analysis (providing critical facility, hazard event, vulnerability data), and as having participated in the mitigation workshop or alternate annex meetings as described in the HMP for the purpose of creating a mitigation strategy to be included in each municipalities annex in Section 9 (Jurisdictional Annexes).





Jurisdiction	Name	Title	Attended SC Kickoff, 8/9/2022	Attended PP Kickoff Meeting, 8/10/2022	Attended SC Risk Assessment Meeting, 10/13/2022	Attended PP Risk Assessment Meeting, 10/13/22	Attended Mitigation Strategy Workshop, 10/17/22	Attended Annex Workshop #1, 11/01/22	Attended Annex Workshop #2, 11/01/22	Attended Annex Workshop #3, 11/03/22	Attended SC Draft Plan Review Meeting, 11/22/22
Monroe County	Timothy Henry	Monroe County Emergency Manager	Х								Х
Monroe County	Matthew Jarrett	Monroe County Office of Emergency Management	Х		Х	Х	Х		Х		Х
Monroe County	Elisabeth Clower	Monroe County Office of Emergency Management	Х		Х	Х	Х				Х
Monroe County	Zack Laffin	Monroe County Office of Emergency Management	Х								
Monroe County	Clement Chung	Monroe County Department of Environmental Services Deputy Director	Х		Х						
Monroe County	Andrew Sansone	Monroe County Department of Environmental Services			Х						Х
Monroe County	Rochelle Bell	Senior Associate Planner, Department of Planning and Development			Х						Х
Monroe County	Scott McCarty	Monroe County DES-GIS Services Division		Х	Х	Х					Х
Monroe County	Jennifer VanHouter	Monroe County Senior GIS Analyst	Х								





Jurisdiction Bill J. Carpenter	Name	Title	Attended SC Kickoff, 8/9/2022	Attended PP Kickoff Meeting, 8/10/2022	Attended SC Risk Assessment Meeting, 10/13/2022	Attended PP Risk Assessment Meeting, 10/13/22	Attended Mitigation Strategy Workshop, 10/17/22	Attended Annex Workshop #1, 11/01/22	Attended Annex Workshop #2, 11/01/22	Attended Annex Workshop #3, 11/03/22	Attended SC Draft Plan Review Meeting, 11/22/22
Rochester-Genesee Regional Transportation Authority (RGRTA)	Jason Palvino	System Safety Manager			Х						
Rochester-Genesee Regional Transportation Authority (RGRTA)	Bill J. Carpenter	CEO	Х								
Monroe County Soil & Water Conservation District	Kelly Emerick	Executive Director	Х		Х						Х
Hilton Central School District	Dr. Casey Kosiorek	Hilton Central School Superintendent	Х								
Hilton Central School District	David Inzana	Director of Security									Х
Monroe Community College in Brighton	Chuck DiSalvo	Public Safety Coordinator	Х		Х						
Monroe Community College in Brighton	Lt. Sam Hillman	Public Safety									Х
Town of Brighton	Chad Roscoe	Junior Engineer						Х			
Village of Brockport	Erica Linden	Manager				Х	Х			X	
Village of Brockport	Dan Verace	Superintendent of Public Works								Х	
Village of Brockport	Chad Fabry	Code Enforcement Officer								Х	
Town of Chile	Dawn Forte	Secretary to Town Supervisor		Х		Х	Х			Х	
Town of Chile	David Lindsey	Commissioner of Public Works								Х	
Village of Churchville	John Hartman	Mayor				Х	Х			Х	
Village of Churchville	Stacy Stanton	Clerk/Treasurer								Х	





Jurisdiction	Name	Title	Attended SC Kickoff, 8/9/2022	Attended PP Kickoff Meeting, 8/10/2022	Attended SC Risk Assessment Meeting, 10/13/2022	Attended PP Risk Assessment Meeting, 10/13/22	Attended Mitigation Strategy Workshop, 10/17/22	Attended Annex Workshop #1, 11/01/22	Attended Annex Workshop #2, 11/01/22	Attended Annex Workshop #3, 11/03/22	Attended SC Draft Plan Review Meeting, 11/22/22
Town of Clarkson	Kevin Moore	Building Inspector/Code Enforcement Officer					Х	Х			
Town/Village of East Rochester	Martin D'Ambrose	Village Administrator				Х	Х			Х	
Town/Village of East Rochester	James J. Herko	Building				Х	Х			Х	
Village of Fairport	Bryan White	Village Manager's Office				X	X				
Village of Fairport	Jill Wiedrick	Planner				Х	X X		Х		
Village of Fairport	Jason Kaluza	Code Enforcement Officer				Х					
Town of Gates	Kurt Rappazzo	Director of Public Works & Highways				Х	Х	Х			
Town of Greece	Kirk Morris	DPW Commissioner		Х		Х	Х				
Town of Greece	John Gauthier	Town of Greece DPW, Associate Engineer		Х		Х	Х				
Town of Greece	John Newcomb	Junior Engineer						Х			
Town of Hamlin	Cheryl Pacelli	Building Inspector								Х	
Town of Henrietta	Steve Schultz	Town Supervisor	Х	Х							
Town of Henrietta	Christopher E. Martin P.E.	Director of Engineering & Planning				Х	Х				
Town of Henrietta	Tim Lessing	Superintendent of Highways				Х	Х				
Town of Henrietta	Lucas Bushen	Deputy Director of Engineering				Х			Х		





Jurisdiction	Name	Title	Attended SC Kickoff, 8/9/2022	Attended PP Kickoff Meeting, 8/10/2022	Attended SC Risk Assessment Meeting, 10/13/2022	Attended PP Risk Assessment Meeting, 10/13/22	Attended Mitigation Strategy Workshop, 10/17/22	Attended Annex Workshop #1, 11/01/22	Attended Annex Workshop #2, 11/01/22	Attended Annex Workshop #3, 11/03/22	Attended SC Draft Plan Review Meeting, 11/22/22
Village of Hilton	Mark Mazzucco	Code Enforcement Officer				Х	Х	Х			
Village of Honeoye Falls	Richard Milne	Mayor		Х		X	Х				
Village of Honeoye Falls	Scott Johnson	Assistant Fire Chief		Х		Х	Х				
Village of Honeoye Falls	Brian Anderson	Village Administrator				Х	Х		Х		
Village of Honeoye Falls	David Ford	Code Enforcement Officer				Х	Х				
Town of Irondequoit	Erin Magee	Deputy Commissioner of Public Works	Х		Х	Х					Х
Town of Mendon											
Town of Ogden	Sue Duggan	Assistant Building Inspector				Х	Х			Х	
Town of Ogden	Mike Zale	Town Supervisor								Х	
Town of Parma	Mark Lenzi	Building Inspector		Х		X	Х	Х			
Town of Parma	Allen Reitz	Fire Marshal				Х	X X	Х			
Town of Penfield	Jeff David	Fire Marshal/Building Department				Х	Х		Х		
Town of Penfield	Michael O'Connor	Engineer/Engineering Department							Х		
Town of Perinton	Eric Williams	Assistant to the Commissioner of Public Works/Department of Public Works				Х	Х		Х		
Town of Pittsford	Salvatore Tantalo	Emergency Manager / Fire Marshal		Х		Х	Х				





Jurisdiction	Name	Title	Attended SC Kickoff, 8/9/2022	Attended PP Kickoff Meeting, 8/10/2022	Attended SC Risk Assessment Meeting, 10/13/2022	Attended PP Risk Assessment Meeting, 10/13/22	Attended Mitigation Strategy Workshop, 10/17/22	Attended Annex Workshop #1, 11/01/22	Attended Annex Workshop #2, 11/01/22	Attended Annex Workshop #3, 11/03/22	Attended SC Draft Plan Review Meeting, 11/22/22
Town of Riga	Debbie Campanella	Town Councilperson				Х	Х			Х	
City of Rochester	Karen St. Aubin	Emergency Management	Х		Х						
City of Rochester	Mark Hudson	Deputy Fire Chief				Х	Х	Х			
City of Rochester	Captain Jamie Renner	Rochester Fire Department, Special Operations Unit				Х	Х	Х			Х
City of Rochester	Dan Arena	Code Compliance Coordinator, NBD				Х	Х				
City of Rochester	Sarah Ruekberg	Rochester Fire Department									Х
Town of Rush	Doug Scarson	Code Enforcement Officer							Х		
Village of Scottsville	Maggie Ridge	Mayor				Х	Х			Х	
Village of Scottsville	Anne Hartman	Village Clerk				Х	Х				
Village of Spencerport	Jacqueline Sullivan	Village Clerk		Х		Х	Х				
Town of Sweden	Lyle Stirk	Code Enforcement Officer								Х	
Town of Webster	Josh Artuso	Director of Community Development				Х	Х				
Town of Webster	Andrew Vorndran	Fire Marshal/Community Development						Х			
Village of Webster	Jake Swingly	Superintendent of Public Works		Х				Х			
Village of Webster	Aron Thompson	Building Inspector				Х	Х	Х			
Town of Wheatland	Jay Coates	Fire Marshal		Х		Х	Х			Х	





	Jurisdiction	Name	Title	Attended SC Kickoff, 8/9/2022	Attended PP Kickoff Meeting, 8/10/2022	Attended SC Risk Assessment Meeting, 10/13/2022	Attended PP Risk Assessment Meeting, 10/13/22	Attended Mitigation Strategy Workshop, 10/17/22	Attended Annex Workshop #1, 11/01/22	Attended Annex Workshop #2, 11/01/22	Attended Annex Workshop #3, 11/03/22	Attended SC Draft Plan Review Meeting, 11/22/22
--	--------------	------	-------	----------------------------------	---	---	---	---	---	---	---	--







Mike Guyon, P.E. Commissioner of Public Works

Timothy P. Henry, Deputy Director of Public Safety|County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate Town of Brighton

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Town of Brighton is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Brighton:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - o Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years



Monroe County Hazard Mitigation Plan Letter of Intent August 18, 2022

- Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Position/Department: Michael Guyon Commissioner of Public Works Phone Number: Email Address: 585-784-5225 Mike.Guyon@TownofBrighton.org Alternate/Secondary POC: Position/Department Chad Roscoe Junior Engineer Phone Number: Email Address: 585-784-5224 Chad.Roscoe@TownofBrighton.org



Monroe County Hazard Mitigation Plan Letter of Intent August 18, 2022

4.Our designated local Floodplain Administrator (FPA) under the NFIP is:Name of NFIP FPA:Position/Department:Chad RoscoeJunior Engineer/DPW

Phone Number: 585-784-5224

Email Address: Chad.Roscoe@TownofBrighton.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Michael E. Guyon



VILLAGE OF BROCKPORT

127 Main Street · Brockport, New York 14420 Telephone (585) 637-5300 · Fax (585) 637-1045 Website: www.brockportny.org

The Victorian Village on the Erie Canal Preserve America Community Listed on the State and National Registers of Historic Places Certified Local Government Tree City USA Community Erie Canalway Heritage Award of Excellence NYS Climate Snart Community NYS Clean Energy Community

September 23, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form -- Village of Brockport

Dear Deputy Director Henry,

This is to confirm that the Village of Brockport is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Brockport:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will
 be responsible for representing their community and assuring that these participation expectations are met by
 their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - o Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - o Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 1. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Erica Linden	Position/Department: Manager				
Phone Number: 585-637-5300 112	Email Address: elinden@brockportny.org				
Alternate/Secondary POC: Dan Verace	Position/Department: Superintendent of Public Works				
Phone Number: 585-637-1060	Email Address: dverace@brockportny.org				

Name of NFIP FPA: Chad Fabry	Position/Department: Code Enforcement Officer
Phone Number: 585-637-5300 x119	Email Address: cfabry@brockportny.org

3. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Margaret B. Blackman Village Mayor



TOWN OF CHIL

STATE OF NEW YORK * COUNTY OF MONROE ESTABLISHED IN 1822



Mark L. DeCory Michael S. Slattery Mary C. Sperr James V. Valerio Town Council Members

David J Dunning Supervisor

Virginia L. Ignatowski Town Clerk

July 26, 2022

Timothy Henry, Deputy Director of Public Safety/County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, NY 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization & Letter of Intent to Participate

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Town of Chili, NY is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Chili:

1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.

Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.

Support the Steering Committee selected to oversee the development of this plan.

Provide representation at municipal Planning Committee meetings (~3 meetings over 6 – 8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).

Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:

Structure and facility inventory data.

Identification of new development and anticipated development.

Identification of natural hazard risk areas.

Identification of natural hazard events and losses that have impacted your community in the last five years. Identification of plans, studies, reports, and ordinances addressing natural hazard risk.

Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

Support public outreach efforts in your community which may include:

Providing notices of the planning project on your municipal website with links to a County project website. Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.).

Advertising and supporting public meetings in your area.

Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.

Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.

Completing data and information collection survey forms in a timely manner.

Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.

Involve your local NFIP Floodplain Administrator in the planning process.

Review draft Plan sections when requested and provide comment and input as appropriate.

Adopt the Plan by resolution of their governing body after FEMA conditional approval.

Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Position/Department:
Dawn Forte	Secretary to Supervisor/Supervisor's Office
Phone Number: 585-889-6111	Email: dforte@townofchili.org
Alternate/Secondary POC:	Position/Department:
David Lindsay	Commissioner of Public Works/Hwy Sup.
Phone Number: 585-889-6180	Email: <u>dlindsay@townofchili.org</u>

Name of NFIP/FPA: David Lindsay

Phone Number: 585-889-6180

Position/Department: Commissioner of Public Works/Hwy Sup.

Email: <u>dlindsay@townofchili.org</u>

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, David Dunning Town Supervisor



Village of Churchville

23 East Buffalo Street P.O. Box 613 Churchville, New York 14428

Office: (585) 293-3720 Fax: (585) 293-2590

DPW: (585) 293-3366 Fax: (585) 293-3693

Timothy P. Henry, Deputy Director of Public Safety County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate Village of Churchville

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Village of Churchville is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Churchville:

- Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.

- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (- 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)

Stacy L. Stanton
Clerk/TreasurerJohn T. Hartman
MayorDiane F. Pusateri
Deputy MayorPa
DPVJohn B. Fitzsimmons
Village AttorneyMichael H. Brown
TrusteeScott A. Cullen
TrusteeJulie L. Michalko
TrusteeJo
Pa
DPV

Paul A. Robinson DPW Superintendent

John A. Mancuso Planning Board Attorney

- Advertising and supporting public meetings in your area
- Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

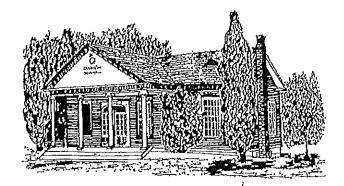
Primary POC: John Hartman	Position/Department: Mayor
Phone Number: 585-293-3720 x112	Email Address: mayor@churchville.net
Alternate/Secondary DOC: St. Ct.	
Alternate/Secondary POC: Stacy Stanton	Position/Department: Clerk/Treasurer
Phone Number: 585-293-3720 x115	Email Address: clerk@churchville.net

Name of NFIP FPA: Tim McElligottPosition/Department: Building Inspector/Code
Enforcement OfficerPhone Number: 585-293-3720 x134Email Address: tim@churchville.net

 Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

John Hashinger Sincerely.

John T. Hartman Mayor



Town of Clarkson 3710 Lake Road PO Box 858 Clarkson, New York 14430

(585) 637-1131

September 22, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Town of Clarkson

Dear Deputy Director Henry,

This is to confirm that the Town of Clarkson is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Clarkson:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas

- o Identification of natural hazard events and losses that have impacted your community in the last five years
- o Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Kevin Moore	Position/Department: Building Inspector/CEO
Phone Number: 585 637-1124 ЦS	Email Address: Kevin.moore@clarksonNY.org
Alternate/Secondary POC:	Position/Department:
Phone Number:	Email Address:

Name of NFIP FPA: Kevin Moore

Position/Department: Building Department

Phone Number: same as above

Email Address: same as above

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Christa Filipowicz, Supervisor Town of Clarkson



Town/Village of East Rochester

317 MAIN STREET, SUITE 2000 EAST ROCHESTER, NEW YORK 14445 585-586-3553 · Fax: 585-419-8282 www.eastrochester.org Mayor – John R. Alfieri **BOARD OF TRUSTEES**

Ted Conners Mark A. Florack Vincent E. Raschiatore Kelley Swagler

ADMINISTRATOR Martin G. D'Ambrose

CLERK TREASURER Shelby E. Simmons

DEPUTY CLERK Sandra Consiglio

July 27, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Town/Village of East Rochester

Dear Deputy Director Henry,

This is to confirm that the Town/Village of East Rochester is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town/Village of East Rochester:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.

EAST ROCHESTER, NEW YORK ... "1897 to 2022 Celebrating 125th Anniversary Quasquicentennial"

- Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - o Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Position/Department:
Martin G. D'Ambrose	Administration
Phone Number:	Email Address:
585-586-3553	mdambrose@eastrochester.org
Alternate/Secondary POC:	Position/Department:
William Marr	Public Works
Phone Number:	Email Address:
585-381-1565	bmarr@eastrochester.org

Name of NFIP FPA:	Position/Department:
James J. Herko Jr.	Building
Phone Number:	Email Address:
585-385-3513	jherko@eastrochester.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

TOWN/VILLAGE OF EAST ROCHESTER John R. Alfieri Mayor

> Cc. Board of Trustees Shelby E. Simmons, Clerk/Treasurer Edward Parrone, Engineer

EAST ROCHESTER, NEW YORK... "1897 to 2022 Celebrating 125th Anniversary Quasquicentennial"

Bryan L. White, ICMA-CM Village Manager



31 S. Main Street, Fairport, NY 14450 Office: (585) 421-3201 Email: blw@fairportny.com

August 29, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Village of Fairport

Dear Deputy Director Henry,

This is to confirm that the Village of Fairport is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Fairport:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - o Identification of plans, studies, reports, and ordinances addressing natural hazard risk

- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Bryan White	Position/Department: Village Manager's Office
Phone Number: 585-421-3201	Email Address: blw@fairportny.com
Alternate/Secondary POC: Jill Wiedrick	Position/Department: Planner
Phone Number: 585-421-3208	Email Address: jmw@fairportny.com

Name of NFIP FPA: Jason Kaluza	Position/Department: Code Enforcement Officer
Phone Number: 585-421-3207	Email Address: jlk@fairportny.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Bryan L. White Village Manager

Town of Gates

Supervisor Cosmo A. Giunta

Town Clerk Veronica M. Owens



Town Council Lee A. Cordero Christopher B. DiPonzio Andrew Loughlin Steve Tucciarello

August 3, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager

Monroe County Office of Emergency Management

1190 Scottsville Road, Suite 200

Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Town of Gates

Dear Deputy Director Henry,

This is to confirm that the Town of Gates is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, Town of Gates:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).

- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Position/Department:
Cosmo A Giunta	Town Supervisor
Phone Number:	Email Address:
585-429-8210	Supervisor@townofgates.org

Alternate/Secondary POC:	Position/Department:
Kurt Rappazzo	Director of Public Works / Highway Superintendent
Phone Number:	Email Address:
585-429-8245	krappazzo@townofgates.org

Position/Department:
Director of Public Works / Highway Superintendent
Email Address:
krappazzo@townofgates.org

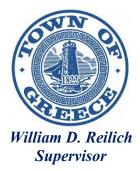
5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Como A Justo

Cosmo A. Giunta

Supervisor



TOWN OF GREECE

One Vince Tofany Boulevard • Greece, NY 14612 Tel: (585) 225-2000 • Fax: (585) 723-2262 www.greecenygov

Timothy P. Henry, Deputy Director of Public Safety, County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate - Town of Greece

Dear Mr. Henry:

This is to confirm that the Town Greece is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Greece:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (approximately 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - \circ $\;$ Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Kirk Morris	Position/Department: Commissioner, Public Works
Phone Number: 585-723-2251	Email Address: KMorris@greeceny.gov
Г	
Alternate/Secondary POC: John Gauthier	Position/Department: Associate Engineer, DPW
Phone Number: 585-723-2251	Email Address: JGauthier@greeceny.gov
	Email 7 Radioss. V Suutinor @grocoonly.gov

Name of NFIP FPA: Paul Mousso	Position/Department: FPA, Technical Services
Phone Number: 585-723-2424	Email Address: PMousso@greeceny.gov

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, c

William D. Reilich, Supervisor Town of Greece

planning process.

- o Advertising and supporting public meetings in your area
- o Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be • informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: BernARD (BJ.) MAIES Position/Department: Firemarshal Phone Number: Email Address: (585) 448-2130 bernAROMAIEr O @ gmail. Com Alternate/Secondary POC: Chery/ Pacelli Position/Department: Building Inspector Phone Number: Email Address: (585) 964-8181 Chepryl. Pacelli HomlinNY. org 4. Our designated local Floodplain Administrator (FPA) under the NFIP is: Name of NFIP FPA: Position/Department: Super UISCsteve Baase **Phone Number:** Email Address: (585) 964 - 8981 St Supervisor @ HAMINNN, org 5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the

Steven Baase - T/o Hamlin Supervisor

AUG - 4 2022

STEPHEN L. SCHULTZ Supervisor

CRAIG ECKERT Deputy Town Supervisor

MILLIE C. SEFRANEK LISA S. BOLZNER M. RICK PAGE JOSEPH D. BELLANCA JR. Council Members

TOWN OF HENRIETTA County of Monroe • State of New York 475 Calkins Road, P.O. Box 999, Henrietta, N.Y. 14467 (585) 334-7700 • www.henrietta.org

Timothy P. Henry, Deputy Director of Public Safety County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate: Town of Henrietta

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Town of Henrietta is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Henrietta:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.

- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings(~ 3 meetings over 6- 8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - o Identification of natural hazard events and losses that have impacted your community in the last five years
 - o Identification of plans, studies, reports, and ordinances addressing natural hazard risk areas



- o Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- o Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - o Providing notices of the planning project on your municipal website with links to a County project website
 - o Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Tim Lessing	Position/Department: Henrietta Superintendent of Highe	ways
Phone Number:	Email Address:	
359 - 7004	Hessing@henrietta.org	
Alternate/Secondary POC: Steve Schultz	Position/Department: Henrietta TOWN Supervisor	
Phone Number: 359 - 7000	Email Address: SS chultz@henrietla.org	

Name of NFIP FPA:	Position/Department:
Kevin Wilson	Director of Building and fire Prevention
Phone Number:	Email Address:
359-7063	kuilson@henrietta.org

5. Recognizes that failure to meet the mrn1mum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Stephen L. Schultz Henrietta Town Supervisor

Joseph M. Lee, Mayor

TRUSTEES Andrew J. Fowler Sherry A. Farrell Larry W_Speer Shannon Zabelny

Shari Wilson-PearceVillage Manager/ClerkJeff PearceSupt. of Public Works

VILLAGE OF HILTON

59 HENRY STREET HILTON, NY 14468 (585) 392-4144 (585) 392-5620 Fax voh@hiltonny.org



August 31, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Village of Hilton

Dear Deputy Director Henry,

This is to confirm that the Village of Hilton is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Hilton:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below.
 These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - $\circ~$ Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Position/Department:
Mark Mazzucco Phone Number:	Code Enforcement Officer Email Address:
(585) 392-4144, Ext 106	mark@hiltonny.org
Alternate/Secondary POC:	Position/Department:
Jeff Pearce Phone Number:	DPW Superintendent Email Address:
(585) 392-9632	jeff@hiltonny.org
4. Our designated local Floodplain Administr	ator (FPA) under the NFIP is:
Name of NFIP FPA:	Position/Department:
Mark Mazzucco Phone Number:	Code Enforcement Officer Email Address:
(585) 392-4144 Ext 106	mark@hiltonny.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Joe Lee, Mayor Village of Hilton



come for the charm, stay for the experience

VILLAGE CLERK-TREASURER GINA HURLEY

> VILLAGE ATTORNEY Matthew Lenahan

MAYOR RICHARD B. MILNE TRUSTEES STANLEY E. WORBOYS DANIEL I. HARRIS JACKIE MAIN

August 8, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Village of Honeoye Falls

Dear Deputy Director Henry,

This is to confirm that the Village of Honeoye Falls is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Honeoye Falls

- Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below.
 These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas

- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a county project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Position/Department:
Richard B, Milne	Mayor
Phone Number:	Email Address:
585-624-1711	mayor@villageofhoneoyefalls.org
Alternate/Secondary POC:	Position/Department:
Scott Johnson	Assistant Fire Chief
Brian Anderson	Village Administrator
Phone Number:	Email Address:
585- 624 1100	sjohnson@honeoyefalls.org
585- 624-1711	banderson@villageofhoneoyefalls.org

Name of NFIP FPA: David Ford

Phone Number: 585-624-1711 Position/Department: Code Enforcement Officer

Email Address: dford@villageofhoneoyefalls.og

 Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincere Richard B. Milne

Mayor



Department of Public Works

Rory Fitzpatrick Town Supervisor

Town of Irondequoit

Erin Magee Commissioner of Public Works

July 29, 2022

Timothy P. Henry, Deputy Director of Public Safety Monroe County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Re: Dear Mr. Henry, County Emergency Manager:

This letter is to confirm that the Town of Irondequoit is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Irondequoit:

- 1. Authorized the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectation), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contact (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop.)
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory date
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years



Department of Public Works

Rory Fitzpatrick Town Supervisor Town of Irondequoit

Erin Magee Commissioner of Public Works

- Identification of plan, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website.
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area.
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POC's are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above are met.



Department of Public Works

Rory Fitzpatrick Town Supervisor Town of Irondequoit

Erin Magee Commissioner of Public Works

Alternate/Secondary POC: Position/Department: Irondequoit Ev Thomas Albert Emergency Manager and Public Work Foreman Emergency Manager and Public Work	POC: Erin Magee sioner	Position/ Department: Public Works
Thomas Albert Emergency Manager and Public Work Foreman Phone Number: 585-353-9289 Our designated local Floodplain Administrator (FPA) under the NFIP is: Name of NFIP FPA: Position/Department: Consultant-	lumber: 585-336-6033	Email Address: <u>Emagee@irondequoit.gov</u>
Thomas Albert Emergency Manager and Public Work Foreman Phone Number: 585-353-9289 Our designated local Floodplain Administrator (FPA) under the NFIP is: Name of NFIP FPA: Position/Department: Consultant-	e/Secondary POC:	Position/Department: Irondequoit Event
Phone Number: 585-353-9289 Email Address: Talber@irondequoit.g Our designated local Floodplain Administrator (FPA) under the NFIP is: Name of NFIP FPA: Position/Department: Consultant-	Albert	Emergency Manager and Public Works
Name of NFIP FPA: Position/Department: Consultant-	•	Email Address: <u>Talber@irondequoit.gov</u>
estably bepartment. Consultant	gnated local Floodplain Ad	ninistrator (FPA) under the NFIP is:
	NFIP FPA:	Position/Department: Consultant-
	tee, AICP	-
Phone Number: 585-295-6656 Email Address: <u>pettee@labellapc.com</u>	umber: 585-295-6656	Email Address: pettee@labellapc.com

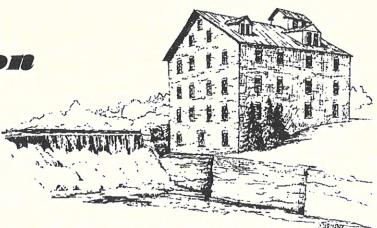
5. Recognized that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Erin Magee, Commissioner of Public Works



Preserving the Past... Protecting the Present... Promoting the Future



Timothy P. Henry, Deputy Director of Public Safety | County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate Town of Mendon

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Town of Mendon is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Mendon:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas

Office of the Supervisor

16 West Main Street, Honeoye Falls, NY 14472-1199 (585) 624-6061 FAX (585) 624-6065 www.townofmendon.org

- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in the community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- Assigns the following person to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: John D. Moffitt Town of Mendon Supervisor 585-624-6061 jmoffitt@townofmendon.org

Alternate/Secondary POC:

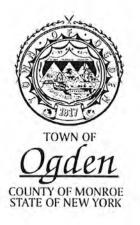
Corey Gates Town of Mendon Bldg Inspector/Code Enforcer/Fire Marshal 585-624-1034 <u>buildinginspector@townofmendon.org</u>

NFIP FPA:

Corey Gates Town of Mendon Bldg Inspector/Code Enforcer/Fire Marshal 585-624-1034 buildinginspector@townofmendon.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, John D. Moffitt



August 19, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Town of Ogden, New York

Dear Deputy Director Henry,

This is to confirm that the Town of Ogden is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Ogden:

- Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development

- o Identification of natural hazard risk areas
- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Mike Zale	Position/Department: Town Supervisor, Supervisors Office
Phone Number: (585) 617-6129	Email Address: supervisor@ogdenny.com
Alternate/Secondary POC: Sue Dugan	Position/Department: Assistant Building Inspector, Building Department
Phone Number: (585) 617-6196	Email Address: asstbuilding@ogdenny.com

Name of NFIP FPA: Brian Thompson	Position/Department: Building Inspector, Building Department
Phone Number: (585) 617-6199	Email Address: building@ogdenny.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Mike Zale Ogden Town Supervisor



TOWN OF PARMA

Building Department 1300 Hilton Parma Road P.O. Box 728 Hilton, New York 14468

Office (585) 392-9449 Fax (585) 392-6659 www.patmany.org

Timothy P. Henry, Deputy Director of Public Safety County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate Town of Parma

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Town of Parma is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Parma:

1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.

• Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.

Support the Steering Committee selected to oversee the development of this plan.

• Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6- 8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).

- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
- o Structure and facility inventory data
- o Identification of new development and anticipated development
- o Identification of natural hazard risk areas
- o Identification of natural hazard events and losses that have impacted your community in the last five years
- o Identification of plans, studies, reports, and ordinances addressing natural hazard risk

o Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
- o Providing notices of the planning project on your municipal website with links to a County project website

o Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g., newsletters, flyers, email blasts, social media, etc.)



TOWN OF PARMA

Building Department

1300 Hilton Parma Road P.O. Box 728 Hilton, New York 14468 Office (585) 392-9449 Fax (585) 392-6659 www.parmany.org

- o Advertising and supporting public meetings in your area
- o Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Mark Lenzi, Building Inspector/Building Department Head. Phone Number: 585-392-9449 Email: <u>building@parmany.org</u>	
Secondary POC:	Allen Reitz, Fire Marshal. Phone Number: 585-392-9449	Email: firemarshal@parmany.org

Our designated local Floodplain Administrator (FPA) under the NFIP is:

 Name of NFIP FPA:
 Mark Lenzi, Building Inspector/Building Department Head.

 Phone Number: 585-392-9449
 Email: building@parmany.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

hm



TOWN OF PENFIELD 3100 Atlantic Avenue, Penfield, New York 14526-9798

August 22, 2022

Timothy P. Henry, Deputy Director of Public Safety/County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, NY 14624

SUBJECT: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate Town of Penfield

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Town of Penfield is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Penfield:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (approximately 3 meetings over 6 to 8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas

- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g., newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process
- Completing data and information collection survey forms in a timely manner
- Identify specific mitigation actions to address each of the natural hazards posing significant (or high or medium) risk to your community
- Involve your local NFIP Floodplain Administrator in the planning process
- Review draft Plan sections when requested and provide comment and input as appropriate
- Adopt the Plan by resolution of their governing body after FEMA conditional approval
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Jeff David	Position/Dept.: Fire Marshal / Building Dept.
Phone Number: (585) 340-8643	Email Address: david@penfield.org
Alternate/Secondary POC: Mark Valentine, P.E.	Position/Dept.: Town Engineer / Engineering Dept.
Phone Number: (585) 340-8645	Email Address: valentine@penfield.org

Name of NFIP FPA: Michael O'Connor	Position/Dept.: Engineer / Engineering Dept.
Phone Number: (585) 340-8619	Email Address: oconnor@penfield.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, are

Mark R. Valentine, P.E. Director of Engineering and Planning Valentine@penfield.org 585-340-8645



TOWN OF PERINTON 100 COBB'S LANE ■ FAIRPORT, NEW YORK 14450-8617 (585) 223-5115 ■ Fax: (585) 223-0448 ■ www.perinton.org

PUBLIC WORKS

8/23/22

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Town of Perinton

Dear Deputy Director Henry,

This is to confirm that the Town of Perinton is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Perinton:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below.
 These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk



- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Eric Williams	Position/Department: Assistant to the Commissioner of Public Works / Department of Public Works
Phone Number:	Email Address:
(585) 223-5115	<u>ewilliams@perinton.org</u>

Alternate/Secondary POC:	Position/Department:
Greg Seigfred	Director of Building and Codes / Department of
	Public Works
Phone Number:	Email Address:
(585) 223-0770	gseigfred@perinton.org

Position/Department:
Commissioner of Public Works / Department of
Public Works
Email Address:
jkennedy@perinton.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

TV _____

Ciaran T. Hanna Town Supervisor

TOWN OF PITTSFORD

SETTLED 1789

11 SOUTH MAIN STREET, PITTSFORD, NY 14534 TEL. 585-248-6200 FAX 585-248-6247

Date: July 25th, 2022

Location: 1190 Scottsville Road, Suite 200, Rochester, NY 14624

Re: Monroe County Hazard Mitigation Plan Update, Authorization & Letter of Intent to Participate

From: William Smith, Town of Pittsford Supervisor

To: Timothy Henry, Deputy Director of Public Safety & Monroe County Emergency Manager

Dear Deputy Director Henry,

This is to confirm that the Town of Pittsford is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Pittsford:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - $\circ\,$ Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
 - Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area

- Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Salvatore Tantalo	Position/Department: Emergency Manager & Fire Marshal
Phone Number: 585-813-4195	Email Address: <u>stantalo@townofpittsford.org</u>
Alternate/Secondary POC: Paul Schenkel	Position/Department: Commissioner of Public Works
Phone Number: 585-248-6250	Email Address: pschenkel@townofpittsford.org

Name of NFIP FPA: Paul Schenkel

Position/Department: Commissioner of Public Works

Phone Number: 585-248-6250

Email Address: pschenkel@townofpittsford.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

WUL a AMMy Tom Supervisor



TOWN OF RIGA 6460 BUFFALO ROAD CHURCHVILLE, NEW YORK 14428

Telephone: (585) 293-3880 Fax: (585) 293-1917 www.townofriga.org

Timothy P. Henry, Deputy Director of Public Safety | County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate Town of Riga

Dear Mr. Henry, County Emergency Manager:

This is to confirm that theTown of Rigais committed to participating in the Monroe CountyHazard Mitigation Plan (HMP) update project.By way of this letter, the [Municipality Name]:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.

- Identify municipal representatives to serve as the planning point of contacts (POC), below.
 These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - o Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
 - Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website



TOWN OF RIGA 6460 BUFFALO ROAD CHURCHVILLE, NEW YORK 14428

Telephone: (585) 293-3880 Fax: (585) 293-1917 www.townofriga.org

- Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
- Advertising and supporting public meetings in your area
- Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Debbie Campanella	Position/Department: Town Council person
Phone Number: 585 - 746 - 1920	Email Address: dccmpanella@front.ernet.net
Alternate/Secondary POC: Brad O'Brocta	Position/Department: Town Supervisor
Phone Number:	Email Address:
585-415-1016	bobracta@tawnofriga.org
4. Our designated local Floodplain Administ	rator (FPA) under the NFIP is:
Name of NFIP FPA: Kin Pape	Position/Department: Town Clerk
Phone Number:	Email Address:
585-293-3880 x122	townclerke townofrige, ung



TOWN OF RIGA 6460 BUFFALO ROAD CHURCHVILLE, NEW YORK 14428

Telephone: (585) 293-3880 Fax: (585) 293-1917 www.townofriga.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

YRQ.

Brad O'Brocta Supervisor Town of Riga



www.cityofrochester.gov

September 2, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form City of Rochester

Dear Deputy Director Henry,

This is to confirm that the City of Rochester is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the City of Rochester

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These
 people will be responsible for representing their community and assuring that these participation
 expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - o Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
 - Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area

۲

- Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and
 potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Mark Hudson Phone Number: (585) 753-3734	Position/Department: Deputy Fire Chief	
	Email Address: Mark.Hudson@cityofrochester.gov	
Alternate/Secondary POC: Suzanne McSain	Position/Department: Permit Office Manager	
Phone Number: (585) 428-7291	Email Address: Suzanne.McSain@cityofrochester.gov	

Position/Department: Permit Office Manager
Email Address: Suzanne.McSain@cityofrochester.gov

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, Malik Evans, Mayor

City of Rochester, NY

<u>Mayor</u> Maggie Ridge <u>Deputy Mayor</u> Andy Fraser



<u>Trustees</u> Wayne LaVair AJ Peck Nikki Whitmarsh

Incorporated 1914

AUG 1 5 2022

22 Main Street, Suite 3, Scottsville, New York 14546 585-889-6050 Fax: 585-889-2505 <u>www.scottsvilleny.org</u>

Timothy P. Henry, Deputy Director of Public Safety County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate Village of Scottsville

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Village of Scottsville is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Scottsville:

- Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.

- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (^{A'} 3 meetings over 68 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - o Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Position/Department: May or Maggie Ridge Phone Number: Email Address: 585-889-6050 Mayor Oscottsuilleny.org Position/Department: Village clerk Alternate/Secondary POC: Anne Hartman Email Address: Villageclerk@Scottsvilleny. Org Phone Number: 889-00 6050 4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA:	Position/Department:
Phone Number:	Email Address:

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Maggie Ridge

Mayor Village of Scottsville 22 Main Street Scottsville, NY 14546



Village of Spencerport 27 West Avenue Spencerport, NY 14559 Tel. 585-352-4771 Fax 585-352-3484 villageoffice@vil.spencerport.ny.us

July 26, 2022

Mr. Timothy P. Henry, Deputy Director of Public Safety, County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, NY 14624

Subject: Monroe County Hazard mitigation Plan Update Authorization and Letter of intent to Participate Village of Spencerport

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Village of Spencerport is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Spencerport:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - a. Execute and report the "Authorization and Acknowledgment" letter to the Monroe County Office of Emergency Management, attention" Tim Henry.
 - b. Identify municipal representatives to serve as the planning point of contact (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - c. Support the Steering Committee selected to oversee the development of this plan.
 - d. Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and Mitigation Strategy Workshop).
 - e. Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - i. Structure and facility inventory data
 - ii. Identification of new development and anticipated development
 - iii. Identification of natural hazard risk areas
 - iv. Identification of natural hazard events and losses that have impacted your community in the last five years
 - v. Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - vi. Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
 - f. Support public outreach efforts in your community which may include:

Gary Penders, Mayor Eric Stowe, Attorney Owen McIntee, Electric Supt.

Tom West, Public Works Supt. Jacqueline Sullivan, Village Clerk Karen Carr, Treasurer

Trustees

Carol Nellis-Ewell, Deputy Mayor Ray Kuntz, Jr.

Charles Hopson David Wohlers



Village of Spencerport 27 West Avenue Spencerport, NY 14559 Tel. 585-352-4771 Fax 585-352-3484 villageoffice@vil.spencerport.ny.us

- i. Providing notices of the planning project on our municipal website with links to a County project website
- ii. Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g., newsletters, flyers, email blasts, social media, etc.)
- iii. Advertising and supporting public meetings in your area
- iv. Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Sever Repetitive Loss property owners in your community.
- g. Assist with the identification of stake holder within your community that should be informed and potentially involved with the planning process.
- h. Completing data and information collection survey forms in a timely manner.
- i. Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- j. Involve your local NFIP Floodplain Administrator in the planning process.
- k. Review draft Plan sections with requested and provide comment and input as appropriate.
- 1. Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- m. Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following personal to the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Gary Penders, Mayor; 585-352-4771; gpenders@vil.spencerport.nv.us

Alternate/Secondary POC: Jacqueline Sullivan, Village Clerk; 585-352-4771; jsullivan@vil.spencerport.ny.us

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Brian Thompson, Building Inspector; 585-617-6195; building@ogdenny.com

5. Recognizes that failure to meeting the minimum participation exceptions and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely.

Gary Penders, Mayor

Gary Penders, Mayor Eric Stowe, Attorney Owen McIntee, Electric Supt.

Tom West, Public Works Supt. Jacqueline Sullivan, Village Clerk Karen Carr, Treasurer

Trustees

Carol Nellis-Ewell, Deputy Mayor Ray Kuntz, Jr.

Charles Hopson David Wohlers



Town of Sweden Supervisor's Office 18 State Street, Brockport, NY 14420

www.townofsweden.org supervisor@townofsweden.org Phone (585) 637-7588 Fax (585) 431-0039

July 26, 2022

Timothy P. Henry, Deputy Director of Public Safety Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

RE: Monroe County Hazard Mitigation Plan Update

Dear Mr. Henry,

This is to confirm that the Town of Sweden is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Sweden:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation, specifically:
 - Execute and return Authorization and Acknowledgement letter
 - Identify municipal representatives to serve as the planning point of contacts (POC)
 - Support the Steering Committee selected to oversee the development of this plan
 - Provide representation at municipal Planning Committee meetings (approximately three meetings over 6-8 months)
 - Provide data and information about the Town of Sweden as requested
 - Support public outreach efforts in the Town of Sweden
 - Assist with the identification of stakeholders in the Town of Sweden who should be informed and potentially involved with the planning process
 - Complete data and information collection survey forms in a timely manner
 - Identify specific mitigation actions to address each of the natural hazards posing significant or high or medium risk to the Town of Sweden
 - Involve the local NFIP Floodplain Administrator in the planning process
 - Review draft Plan sections when requested and provide comment as appropriate
 - Adopt the Plan by resolution of the Sweden Town Board after FEMA conditional approval

- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process
- Assigns the following persons to be the Points of Contact for the Town of Sweden. These POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation are met.

Primary POC: Kevin G. Johnson Position/Department: Supervisor Phone: 585-637-7588 Email: supervisor@townofsweden.org

Alternate/Secondary POC: Patricia Hayles Position/Department: Deputy Supervisor Phone: 585-637-7588 Email: phayles@townofsweden.org

Floodplain Administrator: Phyllis Brudz Position/Department: Planning/Building Phone: 585-637-8684 Email: phyllisb@townofsweden.org

4. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee, will result in the Town of Sweden being excluded from the planning process.

Sincerely,

Thi MS

Kevin G. Johnson, Supervisor



Village of Webster

28 West Main Street Webster, NY 14580 Phone (585) 265-3770 / Fax (585) 265-1004 www.villageofwebster.com

		uperintendent of Public Works: ames (Jake) Swingly			Village Clerk: Heather Halstead		
Trustees:	Gerard Ippolito Jr.	~	Jude Lancy	~	Al Balcaen	~	Karl Laurer

"Where Life Keeps Getting Better"

July 20, 2022

Timothy P. Henry, Deputy Director of Public Safety/ County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update Authorization and Letter of Intent to Participate for the Village of Webster.

Dear Mr. Henry, County Emergency Manager:

This is to confirm that the Village of Webster is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Village of Webster:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct the planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, Attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These
 people will be responsible representing our community and assuring these participation
 expectations are met by our community.
 - o Support the Steering Committee selected oversee the development of this plan.
 - Provide representation at municipal planning committee meetings (~3 meetings over 6-8 months, including a Kick-Off Meeting and Mitigation Strategy Workshop).
 - Provide data and information about our community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data.
 - Identification of new development and anticipated development.

- Identification of natural hazard risk areas.
- Identification of natural hazard events and losses that have impacted our community in the last five years.
- Identification of plans, studies, reports, and ordinances addressing natural hazard risk.
- Identify mitigation activity in our community in the last five years, including progress on previously identified mitigation actions.

o Support public outreach efforts in our community which may include:

- providing notices of the planning project on our municipal website with links to a county project website
- providing notice of the planning project, the availability of Plan documents, and notice of
 public meetings via available local media (e.g. newsletters, flyers, email blasts, social
 media, etc.)
- Advertising and supporting public meetings in our area.
- Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in our community.
- Assist with the identification of stakeholders within our community that should be informed that potentially involved in the planning process.
- o Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to our community.
- o Involve our local NFIP Floodplain Administrator in the planning process.
- o Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of our governing body after FEMA conditional approval.
- Periodically provide the steering committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the point of contact for our jurisdiction. We understand that these POC's are responsible for assuring municipal representation at municipal planning committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the planning partner expectations above, are met.

Primary POC	Position/ Department
Jake Swingly	Supt. of Public Works
Phone Number	Email Address
585-265-3770 ext 115	jswingly@villageofwebster.com
Alternate/ Secondary POC	Position/ Department
Darrell Byerts	Mayor
Phone Number	Email Address
585-265-3770	dbyerts@villageofwebster.com

4. Our designated local floodplain administrator FPA under the NFIP is:

Name of NFIP FPA	Position/ Department
Aron Thompson	Building Inspector
Phone Number	Email Address
585-265-3770 ext 116	BuildingInspector@villageofwebster.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Darrell Byerts

Darrell Byerts, Mayor



Town of Webster Where Life Is Worth Living!

Thomas J. Flaherty Town Supervisor 1000 Ridge Road, Webster, NY 14580-2917 • 585-872-1000 • Fax: 585-872-1352

8-31-22

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Town of Webster

Dear Deputy Director Henry,

This is to confirm that the Town of Webster is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Webster:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below.
 These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o Identification of natural hazard risk areas

- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports, and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- 3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Position/Department:
Andrew Vorndran	Fire Marshal/Community Development
Phone Number:	Email Address:
585-872-7040	avorndran@ci.webster.ny.us
Alternate/Secondary POC:	Position/Department:
Mary Herington	Town Engineer/Engineering
Phone Number:	Email Address:
585-872-7027	mherington@ci.webster.ny.us

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Position/Department:
Director of Community Development/Community
Development
Email Address:
jartuso@ci.webster.ny.us

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, Thomas J. Flaherty

Supervisor Town of Webster

Linda M. Dobson Supervisor Edward Shero Councilman Howard Hazelton Councilman Carl Schoenthal Councilman Timothy Davis Councilman

OF WHEATHAND

Josh Davis Highway Superintendent Laurie B. Czapranski Town Clerk Town Office 22 Main St. P.O. Box 15 Scottsville, NY 14546 Tel: (585) 889-1553 Fax: (585) 889-2933 www.townofwheatland.org

July 26, 2022

Timothy P. Henry, Deputy Director of Public Safety & County Emergency Manager Monroe County Office of Emergency Management 1190 Scottsville Road, Suite 200 Rochester, New York 14624

Subject: Monroe County Hazard Mitigation Plan Update - Authorization Form Town of Wheatland

Dear Deputy Director Henry,

This is to confirm that the Town of Wheatland is committed to participating in the Monroe County Hazard Mitigation Plan (HMP) update project. By way of this letter, the Town of Wheatland:

- 1. Authorizes the Monroe County Office of Emergency Management and the Monroe County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
- 2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Monroe County Office of Emergency Management, attention: Tim Henry.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people
 will be responsible for representing their community and assuring that these participation expectations
 are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - o Structure and facility inventory data
 - o Identification of new development and anticipated development
 - o¹ Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - o Identification of plans, studies, reports, and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - o Advertising and supporting public meetings in your area
 - o Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.
- Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	Position/Department:	
Jay D Coates	Fire Marshal	
Phone Number:	Email Address:	
(585) 739-4882	jdcoates@townofwheatland.org	
Alternate/Secondary POC:	Position/Department:	
Linda Dobson	Town Supervisor	
Phone Number:	Email Address:	
(585) 314-2984	supervisor@townofwheatland.org	

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA:	Position/Department:	
Terry Rech	Code Enforcement Officer	
Phone Number:	Email Address:	
(585) 721-0552	twrech@townofwheatland.org	

 Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, anda maobron

Linda M. Dobson Supervisor Town of Wheatland



APPENDIX E. ACTION WORKSHEET TEMPLATE AND INSTRUCTIONS

This appendix includes the instructions and template provided for the development of Mitigation Strategy Action Worksheets. These worksheets are included in each jurisdictional annex of the plan in compliance with NYSDHSES Mitigation Guidance.





	A	ction W	orksheet			
Project Name:						
Project Number:						
	Ri	sk / Vul	nerabilit	у		
Hazard(s) of Concern:						
Description of the Problem:						
	Action or Project	ct Intend	led for In	nplen	nentation	
Description of the Solution:						
Is this project related to a (Lifeline?	-	Yes		No		
Is this project related to a C located within the 100-yea	Critical Facility r floodplain?	Yes		No		
(If yes, this project must intend t	o protect the 500-year flo	od event	or the actu	ial wor	se case damage s	cenario, whichever is greater)
Level of Protection:			Estimat (losses			
Useful Life:			Goals M	let:		
Estimated Cost:			Mitigat	ion Ac	ction Type:	
	Plan	for Imp	lementat			
Prioritization:			Desired Implem		eframe for ion:	
Estimated Time Required for Project Implementation:			Potenti Sources		nding	
Responsible Organization:				isms	ng to be Used tation if any:	
	Three Alternatives	Consid				
	Action		Es		ed Cost	Evaluation
Alternatives:	No Action		\$0		0	Current problem continues
	Progress Rej	port (fo	r plan ma	inten	ance)	
Date of Status Report:						
Report of Progress:						
Update Evaluation of the Problem and/or Solution:						





Action Worksheet					
Project Name:					
Project Number:					
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate			
Life Safety					
Property Protection					
Cost-Effectiveness					
Technical					
Political					
Legal					
Fiscal					
Environmental					
Social					
Administrative					
Multi-Hazard					
Timeline					
Agency Champion					
Other Community Objectives					
Total					
Priority (High/Med/Low)					





Guidance to Complete the Mitigation Action Worksheet

The following provides additional guidance on how to complete the Mitigation Action Worksheet. Please note that NYS DHSES requires a minimum of TWO proposed mitigation activities.

Action Worksheet

Project Name: Each action must have a unique project number referenced here and in the Action Tables.

Project Number: Each action must have a unique project name referenced here and in the Action Tables.

Assessing the Risk and Vulnerability

Hazard(s) of Concern: Please identify the hazard(s) being addressed with this action. The Hazards of Concern included in the Monroe County Hazard Mitigation Plan include:

- ✓ Disease Outbreak
- ✓ Drought
- ✓ Earthquake
- ✓ Extreme Temperature
- ✓ Flood
- ✓ Hazardous Materials
- ✓ Infestation and Invasive Species
- ✓ Landslide
- ✓ Severe Storm
- ✓ Severe Winter Storm
- ✓ Wildfire

Description of the Problem: Provide a detailed narrative of the problem. Describe the natural hazard you wish to mitigate, its impacts to the jurisdiction, past damages and loss of service, etc. Include the street address of the property/project location (if applicable), adjacent streets, and easily identified landmarks such as water bodies and well-known structures, and end with a brief description of existing conditions (topography, terrain, hydrology) of the site.

Action/Project Intended for Implementation

Description of the Solution: Provide a detailed narrative of the solution. Describe the physical area (project limits) to be affected, both by direct work and by the project's effects; how the action would address the existing conditions previously identified; proposed construction methods, including any excavation and earth-moving activities; where you are in the development process (e.g., are studies and/or drawings complete), etc., the extent of any analyses or studies performed (attach any reports or studies).

Critical Facility: Please indicate whether or not the identified project is related to a critical facility in your community. If a critical facility, indicate whether or not it is located in the 1% annual chance flood area.

Level of Protection: Please identify the level of protection the proposed project will provide. For example, 100-year (1%) flood.

Useful Life: Identify the number of years the project will provide protection against the hazard.





Estimated Cost: Provide an estimated cost for implementation; rough dollar figures are preferred, but if unknown, a specified range is acceptable. Consider all costs associated with implementation. (Low <\$10,000, Medium \$10,000-\$100,000, High >\$100,000).

Estimated Benefits: Identify the benefits that implementation of this project will provide. If dollar amounts are known, include them. If dollar amounts are unknown or are unquantifiable, describe the losses that will be avoided.

Mitigation Action Type:

- Local Plans and Regulations (LPR) These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- <u>Structure and Infrastructure Project (SIP)</u> These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- <u>Natural Systems Protection (NSP)</u> These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- <u>Education and Awareness Programs (EAP)</u> These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.

Goals Met:

- Goal 1: Coordinate hazard mitigation programs and other planning efforts that affect the County.
- **Goal 2:** Prevent hazards from negatively impacting new development.
- **Goal 3:** Protect life, property, and the environment from current and future hazard impacts.
- ➢ Goal 4: Increase public awareness of current and future hazards, their impacts, and ways to reduce vulnerability through education and outreach.
- > Goal 5: Protect, preserve, and restore the functions of natural systems.

Plan for Implementation

Prioritization: Please enter High/Medium/Low. Refer to the prioritization exercise and table.

Estimated Time Required for Project Implementation: Provide the estimated time required to complete the project from start to end. (Short-term, Long-term, or On-going/Continuous)

Responsible Organization: Identify the name of a department or agency responsible for implementation, not the jurisdiction.

Desired Timeline for Implementation: Identify the desired start time for this project. For example, within six months.

Potential Funding Source(s): Multiple sources of potential funding should be listed when appropriate.

Local Planning Mechanism to be Used in Implementation (if any): Consider the use of local planning mechanisms that will be used to implement the project.





Evaluation of Potential Actions/Projects

Actions/Projects Considered: Please consider three different options to mitigate the problem identified. One alternative is always to accept the current level or risk (tolerate the vulnerability/problem) by deciding to take no action at this time. If you choose to take no action, please complete the worksheet up to and including this section and this will be noted in the Plan.

Please include the name of the action considered and a brief reason as to why the action was not selected. The reasoning documents the consideration of these alternatives.

Reporting on Progress (for plan maintenance)

Date of Status Report: This section should be completed during yearly plan maintenance/evaluation.

Report of Progress: Describe what progress, if any, has been made on this project. If it has been determined the jurisdiction no longer wishes to pursue implementation, state that here and indicate why.

Update Evaluation of the Problem and/or Solution: Provide an updated description of the problem and solution, and what has happened since initial consideration/development.

Actions which are not complete may be dropped with a rational provided (e.g., project deemed unfeasible...). Other incomplete actions should clearly be indicated as continuing; indicate percent complete, and identify any hurdles/obstacles/reasons for change in schedule. Even actions that have had no progress to date can be identified as continuing. For any action that is not yet complete and will continue, always consider modifying the action to promote implementation.

Please note this report on progress should be done, at minimum, each year prior to the annual Planning Committee update outlined in the plan maintenance procedures in Section 7 (Plan Maintenance).





Guidance to Complete the Prioritization Table

Complete this table to help evaluate and prioritize each mitigation action being considered by your municipality. Please use these 14 criteria to assist in evaluating and prioritizing new mitigation actions identified. Specifically, for each new mitigation action, assign a numeric rank (-1, 0, or 1) for each of the 14 evaluation criteria in the provided table, defined as follows:

- 1 = Highly effective or feasible
- 0 = Neutral
- -1 = Ineffective or not feasible

Use the numerical results of this exercise to help prioritize your actions as "Low", "Medium" or "High" priority. Your municipality may recognize other factors or considerations that affect your overall prioritization; these should be identified in narrative in the Priority field of the worksheet. The 14 evaluation/prioritization criteria are:

- 1. Life Safety How effective will the action be at protecting lives and preventing injuries?
- 2. **Property Protection** How significant will the action be at eliminating or reducing damage to structures and infrastructure?
- 3. **Cost-Effectiveness** Are the costs to implement the project or initiative commensurate with the benefits achieved?
- 4. **Technical** Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
- 5. **Political** Is there overall public support for the mitigation action? Is there the political will to support it?
- 6. Legal Does the jurisdiction have the authority to implement the action?
- 7. **Fiscal** Can the project be funded under existing program budgets (i.e., is this initiative currently budgeted for)? Or would it require a new budget authorization or funding from another source such as grants?
- 8. **Environmental** What are the potential environmental impacts of the action? Will it comply with environmental regulations?
- 9. **Social** Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
- 10. Administrative Does the jurisdiction have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
- 11. Multi-hazard Does the action reduce the risk to multiple hazards?
- 12. Timeline Can the action be completed in less than 5 years (within our planning horizon)?
- 13. Local Champion Is there a strong advocate for the action or project among the jurisdiction's staff, governing body, or committees that will support the action's implementation?





Other Local Objectives – Does the action advance other local objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of other plans and programs?





APPENDIX F. PLAN MAINTENANCE TOOLS

This appendix includes tools and worksheets to facilitate plan maintenance and review by the Monroe County Steering Committee and Planning Partnership.

In the first year of the performance period, an online performance progress reporting system, the BAToolSM will provide municipal and county representatives direct access to their mitigation initiatives to easily update the status of each project, document successes or obstacles to implementation, add or delete projects to maintain mitigation project implementation. This online program will capture information and roll all input into a report to summarize mitigation strategy progress.



TE TETRA TECH	State Hazard Mitigati	on Plan Review	/S			
a barbard	County Plan Management Dashboard					
S Plan Actions	Washington County Hazard Miliga	tion Plan – 2018		(groc	Primary POC. John Robert	
🗄 Search						
Reports			Junsdictional	Progress		Approval Da
	Total		Complitud		¢	Tapmon () Plan Stolay
Resources	(Albert		We Preservice		<i>i</i> .	2017 Annual
A About	5		particular and a second se			2017 Porvan
Contact Us			Mot You Shared		- C	
	Calcut $\ensuremath{\mathbb{Z}}$ to odd the plan datast. Overlap Manage	nel herme procession (n. 1	no County Opgann (s	throosed.		
	Jurisdiction Name	Annual Review Cycle Open Date	Annual Review Cycle Close Date	Point of Contact	a Action	Review
	Washington County	06/01/2017	09/30/2017	John Robert, 800-555- 5000, jn@omail.com	31	1
	Z Coyol Sompleid	05/01/2017	09/30/2017	Anne Hyde, 800-555-1234, abudo/Dermal.com	9	2

Figure G-1. BATool^{s™} Screenshot

The FEMA 386-4 guidance worksheets are also available to assist with progress reporting. These worksheets are provided in this section for ease of access to the HMP Coordinator and Planning Partnership to maintain the 2023 HMP throughout its period of performance.





step

Worksheet #1 Progress Report

Progress Report Period:	to		Page 1 of 3
(date)	(date)		
Project Title:		Project ID#:	
Responsible Agency:			
Address:			
City/County:			
Contact Person:		_ Title:	
Phone #(s):	email address:		
List Supporting Agencies and Contacts:			
Total Project Cost:			
Anticipated Cost Overrun/Underrun:			
Date of Project Approval:	Start d	late of the project:	
Anticipated completion date:			

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase):

Milestones	Complete	Projected Date of Completion





Plan	Goal(S)	/Ob	ect	ve(S	Addressed:

Page 2 of 3

Go	al:	
Ob	ect	ive:

Indicator of Success (e.g., losses avoided as a result of the acquisition program):

In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

Status (Please check pertinent informatio canceled projects, see Worksheet #2 — to	n and provide explanations for items with an asterisk. For completed or o complete a project evaluation):
Project Status	Project Cost Status
Project on schedule	Cost unchanged
Project completed	Cost overrun*
Project delayed*	*explain:
	Cost underrun*
Project canceled	*explain:
Summary of progress on project for thi A. What was accomplished during this rej	
	porting period?
A. What was accomplished during this rep	porting period?
A. What was accomplished during this rep B. What obstacles, problems, or delays di	porting period?





Other comments:

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Page 3 of 3

Adapted from the North Carolina HMGP Progress Report Form at http://www.dem.dcc.state.nc.us/mitigation/document_index.htm.





Worksheet #2 Evaluate Your Planning Team step 3

lave there been local staffing changes that would warrant inviting different members to the planning	_	
eam?		
Comments/Proposed Action:		
Are there organizations that have been invaluable to the planning process or to project mplementation that should be represented on the planning team?		
Comments/Proposed Action:		
Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team?		
Comments/Proposed Action:		
Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing neeting minutes, etc.) that can be done more efficiently?	9	
Comments/Proposed Action:		
Are there ways to gain more diverse and widespread cooperation?		
Comments/Proposed Action:		
Are there different or additional resources (financial, technical, and human) that are now available for nitigation planning?	r	
		-

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.





Worksheet #3 Evaluate Your Project Results step



Project Name and Number:	
Project Budget:	
Project Description:	Insert location map.
Associated Goal and Objective(s):	Include before and after photos if appropriate.
ndicator of Success (e.g., losses avoided):	
Why not?	YES NO
Was there political support for the action?	
Were enough funds available?	
Were workloads equitably or realistically distributed?	
Was new information discovered about the risks or community tha implementation difficult or no longer sensible?	t made
Was the estimated time of implementation reasonable?	
Were sufficient resources (for example staff and technical assistant	nce) available?
IF YES	





page 2 of 2	YES	NC
Were the outcomes as expected? If No, please explain:		
Did the results achieve the goal and objective(s)? Explain how:		
Did the results achieve the goal and objective(s)? Explain now.		
Was the action cost-effective? Explain how or how not:		
What were the losses avoided after having completed the project?		
If it was a structural project, how did it change the hazard profile?		
Additional comments or other outcomes:		
		_

Prepared by: _____



Worksheet #4 **Revisit Your Risk Assessment** S

tep 4

Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?			
Profile hazard events	Are new historical records available?			
	Are additional maps or new hazard studies available?			
	Have chances of future events (along with their magnitude, extent, etc.) changed?			
	Have recent and future development in the community been checked for their effect on hazard areas?			
Inventory assets	Have inventories of existing structures in hazard areas been updated?			
	Is future land development accounted for in the inventories?			
	Are there any new special high-risk populations?			
Estimate losses	Have loss estimates been updated to account for recent changes?			

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly.





'n

Worksheet #5

Revise the Plan



Prepare to update the plan.

page 1 of 4

When preparing to update the plan:

Check the box when addressed:

 Gather information, including project evaluation worksheets, progress reports, studies, related plans, etc. 	
Comments:	
 Reconvene the planning team, making changes to the team composition as necessary (see results from Worksheet #2). 	
Comments:	

Consider the results of the evaluation and new strategies for the future.

When examining the community consider:

Check the box when addressed:

1. The results of the planning and outreach efforts.	
Comments:	
2. The results of the mitigation efforts.	
Comments:	





	page 2 of
3. Shifts in development trends.	
Comments:	
4. Areas affected by recent disasters.	
Comments:	
5. The recent magnitude, location, and type of the most recent hazard or disa	aster.
Comments:	
6. New studies or technologies.	
Comments:	
7. Changes in local, state, or federal laws, policies, plans, priorities, or funding	g.
Comments:	





		-		r 1
þa.	CDP-	- 5	n	1 10
pres	26	-	~	

	0. 1
8. Changes in the socioeconomic fabric of the community.	
Comments:	
9. Other changing conditions.	
Comments:	

Incorporate your findings into the plan.

When examining the plan consider:

Check the box when addressed:

1. Revisit the risk assessment. (See Worksheet #4)

Comments:

2. Update your goals and strategies.

Comments:

3. Recalculate benefit-cost analyses of projects to prioritize action items.

Comments:





Use the following criteria to evaluate the plan:

page 4 of 4

Criteria	YES	NO	Solution
Are the goals still applicable?			
Have any changes in the state or community made the goals obsolete or irrelevant?			
Do existing actions need to be reprioritized for implementation?			
Do the plan's priorities correspond with state priorities?			
Can actions be implemented with available resources?			

Comments:





APPENDIX G. CRITICAL FACILITY INVENTORY

This appendix contains information and details to support information provided in Section 4 – County Profile and Section 5 – Risk Assessment and provides the distribution of critical facilities located within Monroe County and its jurisdictions. Due to the sensitive nature of this information, this appendix is considered confidential.

CRITICAL FACILITIES AND LIFELINES

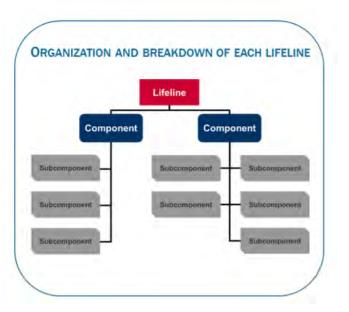
The identification of community lifelines across Monroe County provides an enhancement to the 2023 HMP. FEMA defines a lifeline as: "providing indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security." Identifying community lifelines will help government officials and stakeholders to prioritize, sequence, and focus response efforts towards maintaining or restoring the most critical services and infrastructure within their respective jurisdiction(s). Identifying potential impacts to lifelines can help to inform the planning process and determining priorities in the event an emergency occur. According to FEMA, a community may have the following lifelines:

- Safety and Security
- Food, Water and Shelter
- Health and Medical
- Energy (Power and Fuel)
- Communications
- Transportation
- Hazardous Materials

Each lifeline category is comprised of multiple components and subcomponents that help define the services that make up that lifeline. The components FEMA describes for each lifeline are summarized by Table F-1. A summary of the critical facilities and lifelines within Monroe County are in the remaining sections of this appendix.

Table F-1. FEMA Lifeline Categories and Components

Lifeline Category	Lifeline Components	
Safety and Security	Law Enforcement/Security	
	Fire Service	
	Search and Rescue	
	Government Service	







Lifeline Category	Lifeline Components		
	Community Safety		
	Food		
	Water		
Food, Water and Shelter	Shelter		
	Agriculture		
	Medical Care		
	Public Health		
Health and Medical	Patient Movement		
	Medical Supply Chain		
	Fatality Management		
Entering	Power Grid		
Energy	Fuel		
	Infrastructure		
	Responder Communications		
Communications	Alerts, Warnings, and Messages		
	Finance		
	911 and Dispatch		
	Highway/Roadway/Motor Vehicle		
	Mass Transit		
Transportation	Railway		
	Aviation		
	Maritime		
	Facilities		
Hazardous Material	HAZMAT, Pollutants,		
	Contaminants		

Source: FEMA 2020



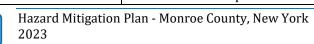


Agriculture Facilities

The following table summarizes the number of agriculture facilities, by type, for each jurisdiction in Monroe County.

Table F-2. Agriculture Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Upstate Niagara Cooperative	45 Fulton Ave	Rochester (C)	Agriculture	Y	Food, Water, Shelter
Artic Glacier Inc	900 Turk Hill Road	Perinton (T)	Agriculture	Y	Food, Water, Shelter
Pittsford Farms	44 N Main Street	Pittsford (V)	Agriculture	Y	Food, Water, Shelter
Foodlink	936 Exchange Street	Rochester (C)	Agriculture	Y	Food, Water, Shelter
Green Acre Farm and Nursery	3456 Latta Road	Greece (T)	Agriculture	Y	Food, Water, Shelter
Robbs Fruit Farm	800 Gallup Road	Ogden (T)	Agriculture	Y	Food, Water, Shelter
Colby Homestead Farms	263 Colby Street	Ogden (T)	Agriculture	Y	Food, Water, Shelter
Gro-Moore Farms	2811 East Henrietta Road	Henrietta (T)	Agriculture	Y	Food, Water, Shelter
Doans Honey Farm	1263 Redmond Road	Hamlin (T)	Agriculture	Y	Food, Water, Shelter
Chases Farm Market	1485 Rush Scottsville Road	Rush (T)	Agriculture	Y	Food, Water, Shelter
Allens Incorporated	180 State Street	Brockport (V)	Agriculture	Y	Food, Water, Shelter
Martin Farms	4021 Redmond Road	Brockport (V)	Agriculture	Y	Food, Water, Shelter
Sweeney Farm	600 Peck Road	Parma (T)	Agriculture	Y	Food, Water, Shelter
Powers Farm Market	161 Marsh Road	Perinton (T)	Agriculture	Y	Food, Water, Shelter
Northern Soy, Inc.	345 Paul Road	Chili (T)	Agriculture	Y	Food, Water, Shelter
Baumans Farm Marketet	1340 Five Mile Line Road	Penfield (T)	Agriculture	Y	Food, Water, Shelter
Upstate Niagara Cooperative	45 Fulton Ave	Rochester (C)	Agriculture	Y	Food, Water, Shelter
Artic Glacier Inc	900 Turk Hill Road	Perinton (T)	Agriculture	Y	Food, Water, Shelter
Pittsford Farms	44 N Main Street	Pittsford (V)	Agriculture	Y	Food, Water, Shelter
Foodlink	936 Exchange Street	Rochester (C)	Agriculture	Y	Food, Water, Shelter
Green Acre Farm and Nursery	3456 Latta Road	Greece (T)	Agriculture	Y	Food, Water, Shelter
Robbs Fruit Farm	800 Gallup Road	Ogden (T)	Agriculture	Y	Food, Water, Shelter







Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Colby Homestead Farms	263 Colby Street	Ogden (T)	Agriculture	Y	Food, Water, Shelter
Gro-Moore Farms	2811 East Henrietta Road	Henrietta (T)	Agriculture	Y	Food, Water, Shelter
Doans Honey Farm	1263 Redmond Road	Hamlin (T)	Agriculture	Y	Food, Water, Shelter
Chases Farm Market	1485 Rush Scottsville Road	Rush (T)	Agriculture	Y	Food, Water, Shelter
Allens Incorporated	180 State Street	Brockport (V)	Agriculture	Y	Food, Water, Shelter
Martin Farms	4021 Redmond Road	Brockport (V)	Agriculture	Y	Food, Water, Shelter
Sweeney Farm	600 Peck Road	Parma (T)	Agriculture	Y	Food, Water, Shelter
Powers Farm Market	161 Marsh Road	Perinton (T)	Agriculture	Y	Food, Water, Shelter
Northern Soy, Inc.	345 Paul Road	Chili (T)	Agriculture	Y	Food, Water, Shelter
Baumans Farm Marketet	1340 Five Mile Line Road	Penfield (T)	Agriculture	Y	Food, Water, Shelter

Source: Monroe County GIS 2022

Airport Facilities

The following table summarizes the number of airport facilities by type, for each jurisdiction in Monroe County.

Table F-3. Airport Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Greater Rochester International Airport	1200 Brooks Ave	Rochester (C)	Airport	Y	Transportation

Source: Monroe County GIS 2022

Alcohol/Drug Rehab Facilities

The following table summarizes the number of Alcohol/Drug Rehab facilities, by type, for each jurisdiction in Monroe County.





Table F-4. Alcohol/Drug Rehab Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Action for A Better Community, Inc.	33 Chestnut St	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Baden Street Settlement of Rochester	585 Joseph Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Barbara Wolk Schwarz Women's CR	2650 Ridgeway Ave	Greece (T)	Alcohol/Drug Rehab	Y	Health and Medical
Browncroft House CR	50 Browncroft Blvd	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center Alexander CR	184 Alexander Street	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center Barrington CR	380 Barrington Street	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center N Clinton SL	30 N Clinton Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center OP	55 Troup St	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Conifer Park, Inc.	1150 University Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Crossroads Apartment Program SL	259 Monroe Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Crossroads, Hanson House CR	561 Mount Hope Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Delphi Drug and Alcohol Council, Inc.	1839 E Ridge Rd	Irondequoit (T)	Alcohol/Drug Rehab	Y	Health and Medical
East House Corporation CR 1	239 Alphonse Street	Irondequoit (T)	Alcohol/Drug Rehab	Y	Health and Medical
East House Corporation CR 2	407 Frederick Douglas Street	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Huther-Doyle Memorial Institute, Inc.	360 East Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Huther-Doyle Memorial Institute, Inc.	259 Monroe Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Huther-Doyle Memorial Institute, Inc.	801 West Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
John L. Norris Addiction Treatment Ctr	1732 South Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Jones Avenue CR	24 Jones Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Pathway Houses of Rochester, NY Inc.	1600 South Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
PRCD, Inc. RRSY	2654 Ridgeway Avenue	Greece (T)	Alcohol/Drug Rehab	Y	Health and Medical
Restart Chemical Dependence Srvcs IR	997 Saint Paul St	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Rochester Mental Health Center OP	490 East Ridge Road	Irondequoit (T)	Alcohol/Drug Rehab	Y	Health and Medical
Sisters of Charity Hosp. OTP 1	435 East Henrietta Road	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Strong Memorial Hospital	300 Crittenden Blvd	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Syracuse Brick House, Inc.	1350 University Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Unity Hospital of Rochester IP	1565 Long Pond Rd	Greece (T)	Alcohol/Drug Rehab	Y	Health and Medical
Unity Hospital of Rochester OP1	2000 Winton Rd S	Brighton (T)	Alcohol/Drug Rehab	Y	Health and Medical
Unity Hospital of Rochester OP2	81 Lake Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Veterans Outreach Center, Inc.	290 Cypress St	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Villa of Hope OP	3300 Dewey Ave	Greece (T)	Alcohol/Drug Rehab	Y	Health and Medical
Westfall Associates, Inc. OP	919 Westfall Road	Brighton (T)	Alcohol/Drug Rehab	Y	Health and Medical
YWCA of Rochester and Monroe County NY	175 North Clinton Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Action for A Better Community, Inc.	33 Chestnut St	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Baden Street Settlement of Rochester	585 Joseph Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Barbara Wolk Schwarz Women's CR	2650 Ridgeway Ave	Greece (T)	Alcohol/Drug Rehab	Y	Health and Medical
Browncroft House CR	50 Browncroft Blvd	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center Alexander CR	184 Alexander Street	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center Barrington CR	380 Barrington Street	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center N Clinton SL	30 N Clinton Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Catholic Family Center OP	55 Troup St	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Conifer Park, Inc.	1150 University Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Crossroads Apartment Program SL	259 Monroe Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Crossroads, Hanson House CR	561 Mount Hope Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Delphi Drug and Alcohol Council, Inc.	1839 E Ridge Rd	Irondequoit (T)	Alcohol/Drug Rehab	Y	Health and Medical
East House Corporation CR 1	239 Alphonse Street	Irondequoit (T)	Alcohol/Drug Rehab	Y	Health and Medical
East House Corporation CR 2	407 Frederick Douglas Street	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Huther-Doyle Memorial Institute, Inc.	360 East Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Huther-Doyle Memorial Institute, Inc.	259 Monroe Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Huther-Doyle Memorial Institute, Inc.	801 West Avenue	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
John L. Norris Addiction Treatment Ctr	1732 South Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Jones Avenue CR	24 Jones Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Pathway Houses of Rochester, NY Inc.	1600 South Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical





	Address	V		FEMA Designated	FEMA Lifeline
Facility Name		Location	Critical Facility Type	Lifeline?	Category
PRCD, Inc. RRSY	2654 Ridgeway Avenue	Greece (T)	Alcohol/Drug Rehab	Y	Health and Medical
Restart Chemical	997 Saint Paul St	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Dependence Srvcs IR			C C		
Rochester Mental	490 East Ridge Road	Irondequoit (T)	Alcohol/Drug Rehab	Y	Health and Medical
Health Center OP	C	1 ()	C		
Sisters of Charity Hosp.	435 East Henrietta Road	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
OTP 1			č		
Strong Memorial	300 Crittenden Blvd	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Hospital			C		
Syracuse Brick House,	1350 University Ave	Rochester (C)	Alcohol/Drug Rehab	Y	Health and Medical
Inc.			C		
Source: Monroe County GIS 202	2				

Bridge Facilities

The following table summarizes the number of critical bridge facilities, by type, for each jurisdiction in Monroe County.

Table F-5. Critical Bridges in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Bridge 1014830	-	Rochester (C)	Bridge	Y	Transportation
Bridge 1050109	-	Rochester (C)	Bridge	Y	Transportation
Bridge 1052239	-	Irondequoit (T)	Bridge	Y	Transportation
Bridge 3317120	-	Rochester (C)	Bridge	Y	Transportation
Bridge 4050129	-	Rochester (C)	Bridge	Y	Transportation
Bridge 4070541	-	Rochester (C)	Bridge	Y	Transportation
Bridge 4070542	-	Rochester (C)	Bridge	Y	Transportation
Bridge 7715160	-	Brighton (T)	Bridge	Y	Transportation

Source: Monroe County GIS 2022

Transportation Facilities

The following table summarizes the number of transportation facilities, by type, for each jurisdiction in Monroe County.





Table F-6. Transportation Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
RTS Bus Terminal	1372 East Main Street	Rochester (C)	Bus	Y	Transportation
Grey Hound Station	186 Cumberland St	Rochester (C)	Bus	Y	Transportation
RTS Transit Center	60 St. Paul, Rochester N.Y. 14604	Rochester (C)	Bus	Y	Transportation
RTS Access	588 Trabold Rd., Rochester N.Y. 14624	Gates (T)	Bus	Y	Transportation
RTS - Transit Center	60 St. Paul Street, Rochester NY 14604	Rochester (C)	Bus	Y	Transportation
BOCES Foreman Center	41 O Connor Road	Perinton (T)	Rail	Y	Transportation
BOCES	6565 E River Road	Rush (T)	Rail	Y	Transportation
Nativity of the Blessed Virgin Mary	60 Holley St	Brockport (V)	Rail	Y	Transportation
St. Joseph's Villa	3300 Dewey Ave	Greece (T)	Rail	Y	Transportation
Francis Parker No. 23 ES	170 Barrington Street	Rochester (C)	Rail	Y	Transportation
St John Neumann	31 Empire Blvd	Irondequoit (T)	Rail	Y	Transportation
DERECH HATORAH- ROCHESTER	125 Kings Hwy S	Irondequoit (T)	Rail	Y	Transportation
Tot-Al Care	6605 Pittsford Palmyra	Perinton (T)	Rail	Y	Transportation
Young Mothers Program	30 Hart Street	Rochester (C)	Rail	Y	Transportation
Train Station	320 Central Ave	Rochester (C)	Rail	Y	Transportation
RIT Bldg 17 Micro Elc Eng	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT CIMS	111 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 50a Mark Ellingson	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 25	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Gosnell Hall	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
RIT Building 10 Lewis Hall	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 23A	117 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT CAST	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Building 2 Ritter Arena	51 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 50a Ellingson Hall	Rochester Monroe County NY 14623	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 23 and 24	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
BOCES Foreman Center	41 O Connor Road	Perinton (T)	Rail	Y	Transportation
BOCES	6565 E River Road	Rush (T)	Rail	Y	Transportation
Nativity of the Blessed Virgin Mary	60 Holley St	Brockport (V)	Rail	Y	Transportation
St. Joseph's Villa	3300 Dewey Ave	Greece (T)	Rail	Y	Transportation
Francis Parker No. 23 ES	170 Barrington Street	Rochester (C)	Rail	Y	Transportation
St John Neumann	31 Empire Blvd	Irondequoit (T)	Rail	Y	Transportation
DERECH HATORAH- ROCHESTER	125 Kings Hwy S	Irondequoit (T)	Rail	Y	Transportation
Tot-Al Care	6605 Pittsford Palmyra	Perinton (T)	Rail	Y	Transportation
Young Mothers Program	30 Hart Street	Rochester (C)	Rail	Y	Transportation
Train Station	320 Central Ave	Rochester (C)	Rail	Y	Transportation
RIT Bldg 17 Micro Elc Eng	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT CIMS	111 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 50a Mark Ellingson	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 25	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Gosnell Hall	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation





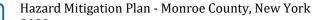
Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
RIT Building 10 Lewis Hall	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 23A	117 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT CAST	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Building 2 Ritter Arena	51 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 50a Ellingson Hall	Rochester Monroe County NY 14623	Henrietta (T)	Rail	Y	Transportation
RIT Bldg 23 and 24	1 Lomb Memorial Dr	Henrietta (T)	Rail	Y	Transportation
DMV - Greece Branch	152 Greece Ridge Center Drive	Greece (T)	DMV	Y	Safety and Security
DMV - Henrietta Branch	2199 E Henrietta Rd	Henrietta (T)	DMV	Y	Safety and Security
DMV - Irondequoit Branch	545 Titus Avenue	Irondequoit (T)	DMV	Y	Safety and Security
DMV - State Office	228 E Main St Suite 250	Rochester (C)	DMV	Y	Safety and Security
DMV - Greece Branch	152 Greece Ridge Center Drive	Greece (T)	DMV	Y	Safety and Security
DMV - Henrietta Branch	2199 E Henrietta Rd	Henrietta (T)	DMV	Y	Safety and Security
DMV - Irondequoit Branch	545 Titus Avenue	Irondequoit (T)	DMV	Y	Safety and Security
DMV - State Office	228 E Main St Suite 250	Rochester (C)	DMV	Y	Safety and Security

Commercial and Major Employer Facilities

The following table summarizes the number of commercial facilities, by type, for each jurisdiction in Monroe County.

Table F-7. Commercial Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Mall At Greece Ridge	271 Greece Ridge Center Drive	Greece (T)	Commercial	N	-
Marketplace Mall	1 Miracle Mile Drive	Henrietta (T)	Commercial	N	-
Wegmans Food Markets Inc.	1500 Brooks Ave	Gates (T)	Commercial	N	-
Hazard Mitigation Plan - Monroe County, New York A-11					



2023

Τŧ



Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Rochester Public	280 North Union Street	Rochester (C)	Commercial	N	-
Market					
Midtown Plaza	211 Midtown Plaza	Rochester (C)	Commercial	N	-
Xerox	800 Phillips Road	Webster (V)	Major Employer	Ν	-
Bausch & Lomb	1 Bausch & Lomb Place	Rochester (C)	Major Employer	Ν	-
Delphi Corporation	1000 Lexington Ave	Rochester (C)	Major Employer	Ν	-
Eastman Kodak Company	343 State St	Rochester (C)	Major Employer	Ν	-
Finger Lakes Health	1150 University Ave	Rochester (C)	Major Employer	Ν	-
Froniter: A Citizens Communication	120 Plymouth Ave N	Rochester (C)	Major Employer	N	-
Harris Corporation R.F. Communications	1680 University Ave	Rochester (C)	Major Employer	N	-
J. P. Morgan Chase And Company	1 Chase Square Tower	Rochester (C)	Major Employer	N	-
Lifetime Healthcare Companies	165 Court St.	Rochester (C)	Major Employer	N	-
Monroe #1 Boces	108 East Ave	East Rochester (T/V)	Major Employer	N	-
Monroe Community College	1000 E Henrietta Rd	Brighton (T)	Major Employer	N	-
Paychex Inc	911 Panorama Trl S	Penfield (T)	Major Employer	N	-
Rochester Institute Of Technology	1 Lomb Memorial Dr	Henrietta (T)	Major Employer	N	-
Unity Health System	2260 Lake Ave	Rochester (C)	Major Employer	Ν	-
University Of Rochester/Strong Health	400 Elmwood Ave	Rochester (C)	Major Employer	N	-
Viahealth	1425 Portland Ave	Rochester (C)	Major Employer	N	-
Wegmans Food Markets Inc.	1500 Brooks Ave	Gates (T)	Major Employer	N	-
Xerox Corporation	350 Linden Oaks	Pittsford (T)	Major Employer	N	-
Tops Markets Llc	6363 Main Street	Brighton (T)	Major Employer	N	-





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Monroe County	39 W Main St	Rochester (C)	Major Employer	N	-
ITT Industries	800 Lee Road #601	Greece (T)	Major Employer	N	-
Hillside Family of Agencies	1183 Monroe Ave	Rochester (C)	Major Employer	N	-
Wegmans	3175 Chili Avenue	Chili (T)	Major Employer	N	-
Wegmans	360 & 370 Market Street	Chili (T)	Major Employer	N	-
Aldi	3170 Chili Avenue	Chili (T)	Major Employer	N	-
Palmers Food	171 Weidner Road	Chili (T)	Major Employer	N	-
American Packaging Corp.	100 Beaver Road	Chili (T)	Major Employer	N	-
C&M Forwarding	3457 Union Street	Chili (T)	Major Employer	N	-
Eastman Kodak Company	1669 Lake Ave	Rochester (C)	Manufacturing	N	-
Xerox	800 Phillips Road	Webster (V)	Major Employer	N	-
Bausch & Lomb	1 Bausch & Lomb Place	Rochester (C)	Major Employer	N	-
Delphi Corporation	1000 Lexington Ave	Rochester (C)	Major Employer	N	-
Eastman Kodak Company	343 State St	Rochester (C)	Major Employer	N	-
Finger Lakes Health	1150 University Ave	Rochester (C)	Major Employer	N	-
Froniter: A Citizens Communication	120 Plymouth Ave N	Rochester (C)	Major Employer	N	-
Harris Corporation R.F. Communications	1680 University Ave	Rochester (C)	Major Employer	N	-
J. P. Morgan Chase And Company	1 Chase Square Tower	Rochester (C)	Major Employer	N	-
Lifetime Healthcare Companies	165 Court St.	Rochester (C)	Major Employer	N	-
Monroe #1 Boces	108 East Ave	East Rochester (T/V)	Major Employer	N	-
Monroe Community College	1000 E Henrietta Rd	Brighton (T)	Major Employer	N	-
Paychex Inc	911 Panorama Trl S	Penfield (T)	Major Employer	N	-





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Rochester Institute Of Technology	1 Lomb Memorial Dr	Henrietta (T)	Major Employer	N	-
Unity Health System	2260 Lake Ave	Rochester (C)	Major Employer	Ν	-
University Of Rochester/Strong Health	400 Elmwood Ave	Rochester (C)	Major Employer	N	-
Viahealth	1425 Portland Ave	Rochester (C)	Major Employer	N	-
Wegmans Food Markets Inc.	1500 Brooks Ave	Gates (T)	Major Employer	N	-
Xerox Corporation	350 Linden Oaks	Pittsford (T)	Major Employer	N	-
Tops Markets Llc	6363 Main Street	Brighton (T)	Major Employer	N	-
Monroe County	39 W Main St	Rochester (C)	Major Employer	N	-
ITT Industries	800 Lee Road #601	Greece (T)	Major Employer	N	-
Hillside Family of Agencies	1183 Monroe Ave	Rochester (C)	Major Employer	N	-
Wegmans	3175 Chili Avenue	Chili (T)	Major Employer	N	-
Wegmans	360 & 370 Market Street	Chili (T)	Major Employer	N	-
Aldi	3170 Chili Avenue	Chili (T)	Major Employer	N	-
Palmers Food	171 Weidner Road	Chili (T)	Major Employer	N	-
American Packaging Corp.	100 Beaver Road	Chili (T)	Major Employer	N	-
C&M Forwarding	3457 Union Street	Chili (T)	Major Employer	N	-
Eastman Kodak Company	1669 Lake Ave	Rochester (C)	Manufacturing	N	-
Wegmans Food Markets Inc.	3175 Chili Avenue	Chili (T)	Food	Y	Food, Water, Shelter
Wegmans Food Markets Inc.	360 & 370 Market Street	Chili (T)	Food	Y	Food, Water, Shelter
Aldi	3170 Chili Avenue, Suite 3	Chili (T)	Food	Y	Food, Water, Shelter
Palmers	171 Weidner Road	Chili (T)	Food	Y	Food, Water, Shelter





Communications Facilities

The following table summarizes the number of communications facilities, by type, for each jurisdiction in Monroe County.

Table F-8. Communications Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
WROC-TV 8	201 Humboldt St	Rochester (C)	Communication	Y	Communications
WHAM TV-13	4225 W Henrietta Road	Henrietta (T)	Communication	Y	Communications
WHEC-TV 10	171 East Ave	Rochester (C)	Communication	Y	Communications
WXXI-TV 21	280 State St	Rochester (C)	Communication	Y	Communications
Cobbs Hill	1530 Highland Ave.	Rochester (C)	Communication	Y	Communications
PSB	150 South Plymouth Ave.	Rochester (C)	Communication	Y	Communications
Greece Ridgeway	3041 Ridgeway Ave	Greece (T)	Communication	Y	Communications
Henrietta	1391 Middle Rd.	Henrietta (T)	Communication	Y	Communications
Baker	935 Thayer Rd.	Perinton (T)	Communication	Y	Communications
Brockport	5000 Lake Rd. South	Sweden (T)	Communication	Y	Communications
Webster	1005 Picture Parkway	Webster (T)	Communication	Y	Communications
Xerox	100 Clinton Ave. South	Rochester (C)	Communication	Y	Communications
Greece Ridge	1299 Long Pond Rd.	Greece (T)	Communication	Y	Communications
Irondequoit	1280 Titus Ave.	Irondequoit (T)	Communication	Y	Communications
Westfall	111 Westfall rd.	Rochester (C)	Communication	Y	Communications
Van Lare	1574 Lakeshore Blvd.	Rochester (C)	Communication	Y	Communications
Hilton	7 Cedar Terrace	Hilton (V)	Communication	Y	Communications
Edison	655 Colfax St.	Rochester (C)	Communication	Y	Communications
Fairport	33 Summit St.	Fairport (V)	Communication	Y	Communications
Hamlin	91 Railroad Ave.	Hamlin (T)	Communication	Y	Communications
Churchville	44 North Main St.	Churchville (V)	Communication	Y	Communications
Honeoye Falls	7 Monroe St.	Honeoye Falls (V)	Communication	Y	Communications
Scottsville	22 Main St.	Scottsville (V)	Communication	Y	Communications
Spencerport RG&E	1880 North Union St.	Parma (T)	Communication	Y	Communications
Mt Read	1766 Latta Rd.	Greece (T)	Communication	Y	Communications
Laurelton	405 Empire Blvd.	Irondequoit (T)	Communication	Y	Communications

Hazard Mitigation Plan - Monroe County, New York 2023

A-15



Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Pittsford	472 Mendon Rd.	Pittsford (T)	Communication	Y	Communications
PSTF	1190 Scottsville Rd.	Rochester (C)	Communication	Y	Communications
Airport	1200 Brooks Ave.	Rochester (C)	Communication	Y	Communications
Dewitt	831 Dewitt rd.	Webster (T)	Communication	Y	Communications
East High	1801 East Main St.	Rochester (C)	Communication	Y	Communications
Quint-6 (Engine 2)	1215 N. Clinton Ave	Rochester (C)	Communication	Y	Communications
St Johns	150 Highland Ave.	Rochester (C)	Communication	Y	Communications
Zoo	2222 St. Paul St.	Rochester (C)	Communication	Y	Communications
Widger	153 Widger Road	Ogden (T)	Communication	Y	Communications
Brockport Village	38 East Ave.	Brockport (V)	Communication	Y	Communications
Chili	4304 Union St.	Chili (T)	Communication	Y	Communications
Greece Shoremont	4901 Dewey Ave.	Greece (T)	Communication	Y	Communications
Perinton	735 Thayer Rd.	Perinton (T)	Communication	Y	Communications
Rush	492 Stoneybrook Rd.	Rush (T)	Communication	Y	Communications
Webster	172 Sanford St.	Webster (T)	Communication	Y	Communications
Brighton Fire House 1	3100 Elmwood Ave.	Brighton (T)	Communication	Y	Communications
Iroquois School	150 Colebrook Dr.	Irondequoit (T)	Communication	Y	Communications
111 Field Street Telecom Hotel	111 Field Street	Rochester (C)	Communication	Y	Communications
120 Plymouth Ave North	120 Plymouth Ave	Rochester (C)	Communication	Y	Communications
Chili Cell Tower/Chili FD	3225 Chili Avenue	Chili (T)	Communication	Y	Communications
Chili Cell Tower/Pando Vasilovski Property	20 Chili Wheatland TL Road	Chili (T)	Communication	Y	Communications
Chili Cell Tower/Tesch Trust Property	918 Chili Scottsville Road	Chili (T)	Communication	Y	Communications
Chili Cell Tower/Sprint Spectrum LP Leasse	850 Ballantyne Road	Chili (T)	Communication	Y	Communications
Chili Cell Tower/Town of Chili	3720 Union Street	Chili (T)	Communication	Y	Communications
Chili Cell Tower/Town of Chili	3235 Chili Avenue	Chili (T)	Communication	Y	Communications

TŁ 2



Fooilite: Nomo	Address	Location	Coiti col Eo cilitre Terre o	FEMA Designated	FEMA Lifeline
Facility Name Chili Cell	50R Jetview Drive	Chili (T)	Critical Facility Type Communication	Lifeline? Y	Category Communications
Tower/Rochester	JUK JEWIEW Drive	$\operatorname{Cmn}(1)$	Communication	Y	Communications
Cornerstone Group					
Property					
Chili Cell Tower/C.	71 Golden Road	Chili (T)	Communication	Y	Communications
Moran Inc Property	, i Soluon Roud		Communication	1	communications
Chili Cell Tower/Chili	3225 Chili Avenue	Chili (T)	Communication	Y	Communications
FD		(-)		_	
Chili Cell Tower/Pando	20 Chili Wheatland TL Road	Chili (T)	Communication	Y	Communications
Vasilovski Property		、 <i>,</i> ,			
Chili Cell Tower/Tesch	918 Chili Scottsville Road	Chili (T)	Communication	Y	Communications
Trust Property					
Chili Cell Tower/Sprint	850 Ballantyne Road	Chili (T)	Communication	Y	Communications
Spectrum LP Lease					
Chili Cell Tower/Town	3720 Union Street	Chili (T)	Communication	Y	Communications
of Chili					
Chili Cell Tower/Town	3235 Chili Avenue	Chili (T)	Communication	Y	Communications
of Chili					
Chili Cell	50R Jetview Drive	Chili (T)	Communication	Y	Communications
Tower/Rochester					
Cornerstone Group					
Property Chili Cell Tower/C.	71 C 11 D 1	C1 '1' (T)		V	<u> </u>
	71 Golden Road	Chili (T)	Communication	Y	Communications
Moran Inc. Property Elantic Tele-Henrietta	100 Clay Road	Henrietta (T)	Information Technology	Y	Communications
	180 S Clinton Ave	、 <i>、 、 、</i>		I Y	
Frontier, a Citizen Comm	180 S Clinton Ave	Rochester (C)	Information Technology	Ŷ	Communications
Lenel Systems	1212 Pittsford Victor Rd	Perinton (T)	Information Technology	Y	Communications
International	1212 Philsiola victor Ka	remium (1)	mormation recimology	I	Communications
Scottsville Regeneration	NYS Thruway RT 90	Scottsville (V)	Information Technology	Y	Communications
Sunguard Sct Inc.	3000 Ridge Rd	Irondequoit (T)	Information Technology	Y	Communications
Adesta Regeneration	NYS Thruway MP 366	Scottsville (V)	Information Technology	Y	Communications
Facility No 7	IN IS THIUWAY IVIT 500	Scousville (V)	mormation recimology	I	Communications
Henrietta Regeneration	County Rt 136	Greece (T)	Information Technology	Y	Communications
riemiena regeneration	County IXI 150		mormation reemiology	1	Communications





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Elantic Tele-Henrietta	100 Clay Road	Henrietta (T)	Information Technology	Y	Communications
Frontier, a Citizen	180 S Clinton Ave	Rochester (C)	Information Technology	Y	Communications
Comm					
Lenel Systems	1212 Pittsford Victor Rd	Perinton (T)	Information Technology	Y	Communications
International					
Scottsville Regeneration	NYS Thruway RT 90	Scottsville (V)	Information Technology	Y	Communications
Sunguard Sct Inc.	3000 Ridge Rd	Irondequoit (T)	Information Technology	Y	Communications
Adesta Regeneration	NYS Thruway MP 366	Scottsville (V)	Information Technology	Y	Communications
Facility No 7					
Henrietta Regeneration	County Rt 136	Greece (T)	Information Technology	Y	Communications
Source: Monroe County GIS 202	2	•			

Community Facilities

The following table summarizes the number of community facilities, by type, for each jurisdiction in Monroe County.

Table F-9. Community Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Monroe County City Place	50 W Main St	Rochester (C)	Government Building	Y	Safety and Security
City Public Safety Building	150 South Plymouth Av	Rochester (C)	Government Building	Y	Safety and Security
Criminal Justice Training Center	3165 Brighton Henrietta Town Line Road	Henrietta (T)	Government Building	Y	Safety and Security
US Naval & Marine Corps Reserve Center	439 Paul Road	Chili (T)	Government Building	Y	Safety and Security
US Coast Guard Station	5500 St Paul Blvd	Rochester (C)	Government Building	Y	Safety and Security
US Army Reserve Center	515 Ridge Road	Webster (T)	Government Building	Y	Safety and Security
City School District Central Office	131 West Broad Street	Rochester (C)	Government Building	Y	Safety and Security
Rochester DES Building Services	414 Andrew St	Rochester (C)	Government Building	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Rochester DES Water & Lighting	10 Felix St	Rochester (C)	Government Building	Y	Safety and Security
Rochester Parks Dept.	400 Dewey Ave	Rochester (C)	Government Building	Y	Safety and Security
Animal Control Center	184 Verona St	Rochester (C)	Government Building	Y	Safety and Security
County Office Building	39 W Main St	Rochester (C)	Government Building	Y	Safety and Security
Monroe County Public Safety Commun	1530 Highland Ave	Rochester (C)	Government Building	Y	Safety and Security
Monroe County Human Services	691 St Paul St	Rochester (C)	Government Building	Y	Safety and Security
NYARNG Armory	42 Patriot Way	Rochester (C)	Government Building	Y	Safety and Security
NY Appellate Court	50 East Ave	Rochester (C)	Government Building	Y	Safety and Security
NYS DOT	1530 Jefferson Road	Henrietta (T)	Government Building	Y	Safety and Security
NYS DOT Traffic Signal Maintenance	1155 Scottsville Road	Chili (T)	Government Building	Y	Safety and Security
US Army Reserve Center	2035 N Goodman St	Irondequoit (T)	Government Building	Y	Safety and Security
Chili Community Center (Recreation/Library/Sen ior Ctr)	3237 Chili Avenue	Chili (T)	Government Building	Y	Safety and Security
Kenneth B. Keating Federal	100 State Street	Rochester (C)	Government Building	Y	Safety and Security
FBI	1200 Scottsville Road, Building C	Chili (T)	Government Building	Y	Safety and Security
FBI Office	1200 Scottsville Road Building C	Chili (T)	Government Building	Y	Safety and Security
Cadilac Hotel	45 Chestnut St	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Center for Youth Services	905 Monroe Ave	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Francis Center	547 Joseph Ave	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Genesis House	35 Ardmore St	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Jennifer House	934 Culver Road	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Mercy Community Services	2763 Culver Road	Irondequoit (T)	Homeless Shelter	Y	Food, Water, Shelter
Neilson House	383 West Ave	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Open Door Mission	219 West Main Street	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Sanctuary House	715 Dewey Ave	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Salvation Army Booth Haven	78 Liberty Pole Way	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Salvation Army Hope House	100 West Ave	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
VOC richards House	459 South Ave	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Volunteers of America	175 Ward Street	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Women's Place	146 Hobart Street	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
YWCA	175 North Clinton Ave	Rochester (C)	Homeless Shelter	Y	Food, Water, Shelter
Pittsford Community Library	200 Fairport Road	Pittsford (T)	Library	N	
Newman Riga Library	1 S Main St	Churchville (V)	Library	N	
Rush Public Library	5977 E Henrietta Road	Rush (T)	Library	N	
Scottsville Free Library	28 Main St	Scottsville (V)	Library	N	
Scottsville Free Library	883 George St	Wheatland (T)	Library	N	
Webster Public Library	980 Ridge Road	Webster (T)	Library	N	
Central Library	115 South Ave	Rochester (C)	Library	N	
Rochester Public Library	310 Arnett Boulevard	Rochester (C)	Library	N	
Rochester Public Library	3557 Lake Ave	Rochester (C)	Library	N	
Rochester Public Library	971 South Ave	Rochester (C)	Library	N	
Rochester Public Library	851 Joseph Ave	Rochester (C)	Library	N	
Rochester Public Library	956 Lyell Ave	Rochester (C)	Library	N	
Rochester Public Library	1111 Dewey Ave	Rochester (C)	Library	N	
Rochester Public Library	809 Monroe Ave	Rochester (C)	Library	N	





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Rochester Public Library	939 Bay St	Rochester (C)	Library	N	
Rochester Public Library	33 Dr. Samuel McCree Way	Rochester (C)	Library	N	
Rochester Public Library	611 Winton Road N	Rochester (C)	Library	N	
Brighton Memorial Library	2300 Elmwood Ave	Brighton (T)	Library	N	
Gates Public Library	902 Elmgrove Road	Gates (T)	Library	N	
Ogden Farmers' Library	269 Ogden Center Road	Ogden (T)	Library	N	
Brockport-Seymour Library	161 East Ave	Clarkson (T)	Library	N	
East Rochester Public Library	111 W Elm St	East Rochester (T/V)	Library	Ν	
Fairport Public Library	1 Village Landing	Fairport (V)	Library	N	
Greece Public Library	2 Vince Tofany Blvd	Greece (T)	Library	Ν	
Hamlin Public Library	1680 Lake Road	Hamlin (T)	Library	N	
Henrietta Public Library	455 Calkins Road	Henrietta (T)	Library	Ν	
Irondequoit Public Library	45 Cooper Road	Irondequoit (T)	Library	N	
Irondequoit Public Library	2180 Ridge Road East	Irondequoit (T)	Library	N	
Mendon Public Library	15 Monroe St	Honeoye Falls (V)	Library	N	
Parma Public Library	7 West Ave	Hilton (V)	Library	Ν	
Pittsford Community Library	24 State St	Pittsford (V)	Library	N	
Penfield Public Library	1985 Baird Road	Penfield (T)	Library	Ν	
Adams Basin Post Office	4303 Canal Road	Ogden (T)	Post Office	Y	Safety and Security
Brockport Post Office	14 Main St	Brockport (V)	Post Office	Y	Safety and Security
Churchville Post Office	42 S Main St	Churchville (V)	Post Office	Y	Safety and Security
Clarkson Post Office	3720 Lake Road	Clarkson (T)	Post Office	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
East Rochester Post Office	206 W Commercial St	East Rochester (T/V)	Post Office	Y	Safety and Security
Fairport Retail Store	6740 Pittsford Palmyra Road	Perinton (T)	Post Office	Y	Safety and Security
Henrietta Post Office	25 Goodburlet Road	Henrietta (T)	Post Office	Y	Safety and Security
Honeoye Falls Post Office	39 W Main St	Honeoye Falls (V)	Post Office	Y	Safety and Security
Hamlin Post Office	133 Railroad Ave	Hamlin (T)	Post Office	Y	Safety and Security
Hilton Post Office	25 South Ave	Hilton (V)	Post Office	Y	Safety and Security
Mendon Post Office	53 Assembly Dr	Mendon (T)	Post Office	Y	Safety and Security
Mumford Post Office	38 Dakin St	Wheatland (T)	Post Office	Y	Safety and Security
North Chili Post Office	3235 Union St	Chili (T)	Post Office	Y	Safety and Security
North Greece Post Office	640 N Greece Road	Greece (T)	Post Office	Y	Safety and Security
Penfield Post Office	2080 Fairport Nine Mile Point Road	Penfield (T)	Post Office	Y	Safety and Security
Pittsford Post Office	5607 Pittsford Palmyra Road	Pittsford (T)	Post Office	Y	Safety and Security
Scottsville Post Office	5 Rochester St	Scottsville (V)	Post Office	Y	Safety and Security
Rush Post Office	6144 Rush Lima Road	Rush (T)	Post Office	Y	Safety and Security
Spencerport Post Office	11 Amity St	Spencerport (V)	Post Office	Y	Safety and Security
Webster Post Office	75 Barrett Dr	Webster (V)	Post Office	Y	Safety and Security
West Henrietta Post Office	772 Erie Station Road	Henrietta (T)	Post Office	Y	Safety and Security
Irondequoit Station PO	425 E Ridge Road	Irondequoit (T)	Post Office	Y	Safety and Security
Loehmann's Plaza Branch PO	1900 S Clinton Ave	Brighton (T)	Post Office	Y	Safety and Security
Ridgemont Plaza Branch PO	2833 W Ridge Road	Greece (T)	Post Office	Y	Safety and Security
Beechwood Station PO	300 Waring Road	Rochester (C)	Post Office	Y	Safety and Security
Midtown Plaza Station PO	105 Midtown Plaza	Rochester (C)	Post Office	Y	Safety and Security
Greece Branch PO	3245 Latta Road	Greece (T)	Post Office	Y	Safety and Security
Dewey Station PO	376 Lexington Ave	Rochester (C)	Post Office	Y	Safety and Security
West Ridge Station PO	1857 Dewey Ave	Rochester (C)	Post Office	Y	Safety and Security

A-22

Ŧŧ





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Federal Station PO	100 State St	Rochester (C)	Post Office	Y	Safety and Security
Brighton Station PO	130 Winton Road N	Rochester (C)	Post Office	Y	Safety and Security
Bullshead Station/Westgate Branch PO	1485 Howard Road	Gates (T)	Post Office	Y	Safety and Security
Panorama Branch PO	1614	Penfield (T)	Post Office	Y	Safety and Security
Downtown Station PO	216 Cumberland	Rochester (C)	Post Office	Y	Safety and Security
Lexington Station PO	1280 Lexington Ave	Rochester (C)	Post Office	Y	Safety and Security
Rochester Main Post Office/GMF Carriers	1335 Jefferson Road	Henrietta (T)	Post Office	Y	Safety and Security
Westgate Branch/Window Service	525 Thurston	Rochester (C)	Post Office	Y	Safety and Security
Fairport Branch	770 Ayrault Road	Perinton (T)	Post Office	Y	Safety and Security
Federal Express	1195 Scottsville Road	Rochester (C)	Post Office	Y	Safety and Security
Blue Cross Arena	1 War Memorial Squar	Rochester (C)	Recreation Center	N	
Frontier Field	1 Morrie Silver Way	Rochester (C)	Recreation Center	N	
Thomas Creek Ice Arena	80 Lyndon Road	Perinton (T)	Recreation Center	N	
Monroe County Fairgrounds	Calkins Road	Henrietta (T)	Recreation Center	N	
Seabreeze Amusement Park	4600 Culver Road	Irondequoit (T)	Recreation Center	N	
Special Olympics Stadium	1 New Campus Drive	Brockport (V)	Recreation Center	N	
Sahlens Stadium	512 Smith St	Rochester (C)	Recreation Center	N	
Churchville Village Office	23 E Buffalo St	Churchville (V)	Town Hall	Y	Safety and Security
Clarkson Town Hall	3710 Lake Rd N, Brockport, NY 14420	Clarkson (T)	Town Hall	Y	Safety and Security
Fairport Town Hall		Fairport (V)	Town Hall	Y	Safety and Security
Greece Town Hall		Greece (T)	Town Hall	Y	Safety and Security
Irondequoit Town Hall		Irondequoit (T)	Town Hall	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Rush Town Hall		Rush (T)	Town Hall	Y	Safety and Security
Penfield Town Hall	3100 Atlantic Ave, Penfield, NY 14526	Penfield (T)	Town Hall	Y	Safety and Security
Gates Town Hall	1605 Buffalo Road	Gates (T)	Town Hall	Y	Safety and Security
Spencerport Village Hall		Spencerport (V)	Town Hall	Y	Safety and Security
Monroe County Office Building		Rochester (C)	Town Hall	Y	Safety and Security
East Rochester Town Hall	120 West Commercial Street, East Roches*	East Rochester (T/V)	Town Hall	Y	Safety and Security
Sweden Town Hall		Brockport (V)	Town Hall	Y	Safety and Security
Rochester City Hall	30 Church St	Rochester (C)	Town Hall	Y	Safety and Security
Webster Town Hall		Webster (T)	Town Hall	Y	Safety and Security
Ogden Town Hall	269 Ogden Center Road	Ogden (T)	Town Hall	Y	Safety and Security
Brockport Village Offices		Brockport (V)	Town Hall	Y	Safety and Security
Hamlin Town Hall	1658 Lake Road	Hamlin (T)	Town Hall	Y	Safety and Security
Henrietta Town Hall	475 Calkins Rd, ROCHESTER, NY 14623	Henrietta (T)	Town Hall	Y	Safety and Security
Honeoye Falls Village Hall	5 East St, Honeoye Falls, NY 14472	Honeoye Falls (V)	Town Hall	Y	Safety and Security
Mendon Town Hall	16 West Main Street	Honeoye Falls (V)	Town Hall	Y	Safety and Security
Perinton Town Hall		Perinton (T)	Town Hall	Y	Safety and Security
Pittsford Town Hall	11 South Main St, Pittsford, NY 14534	Pittsford (V)	Town Hall	Y	Safety and Security
Parma Town Hall		Parma (T)	Town Hall	Y	Safety and Security
Wheatland/Scottsville Town & Village Off	22 Main St	Scottsville (V)	Town Hall	Y	Safety and Security
Pittsford Village Hall		Pittsford (V)	Town Hall	Y	Safety and Security
Riga Town Hall	6460 Buffalo Rd, Churchville, NY 14428	Riga (T)	Town Hall	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Chili Town Hall &	3333 Chili Ave	Chili (T)	Town Hall	Y	Safety and Security
Town Court					
Brighton Town Hall		Brighton (T)	Town Hall	Y	Safety and Security

Court and Correctional Facilities

The following table summarizes the number of court and correctional facilities, by type, for each jurisdiction in Monroe County.

Table F-10. Court and Correctional Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Monroe County Jail	130 S Plymouth Ave	Rochester (C)	Correctional Facility	Y	Safety and Security
Monroe County Correctional Facility	750 E Henrietta Rd	Brighton (T)	Correctional Facility	Y	Safety and Security
Children's Detention Center	355 Westfall Rd	Rush (T)	Correctional Facility	Y	Safety and Security
Irondequoit Town Court	1280 Titus Avenue	Irondequoit (T)	Court	Y	Safety and Security
Town of Webster	1000 Ridge Road	Webster (T)	Court	Y	Safety and Security
Town of Rush Court	5977 E Henrietta Rd	Rush (T)	Court	Y	Safety and Security
Town of Parma Court	1300 Hilton Parma Corners Road	Parma (T)	Court	Y	Safety and Security
Town of Mendon Court	16 West Main Street	Honeoye Falls (V)	Court	Y	Safety and Security
Town of Perinton Court	1350 Turk Hill Road	Perinton (T)	Court	Y	Safety and Security
Town of East Rochester Court	317 Main St	East Rochester (T/V)	Court	Y	Safety and Security
Town of Pittsford Court	24 State Street	Pittsford (V)	Court	Y	Safety and Security
Town of Hamlin Court	1658 Lake Road	Hamlin (T)	Court	Y	Safety and Security
Town of Gates Court	1605 Buffalo Road	Gates (T)	Court	Y	Safety and Security
Town of Penfield Court	1985 Baird Road	Penfield (T)	Court	Y	Safety and Security
Town of Clarkson Court	3655 Lake Road	Clarkson (T)	Court	Y	Safety and Security
Town of Sweden court	18 State Street	Brockport (V)	Court	Y	Safety and Security
Town of Brighton Court	2300 Elmwood Ave	Brighton (T)	Court	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Town of Ogden Court	269 Ogden Center Road	Ogden (T)	Court	Y	Safety and Security
Town of Riga Court	12 South Main Street	Riga (T)	Court	Y	Safety and Security
Town of Chili	3235 Chili Ave	Chili (T)	Court	Y	Safety and Security
Town of Henrietta Court	135 Calkins Road	Henrietta (T)	Court	Y	Safety and Security
Town of Wheatland Court	22 Main St	Scottsville (V)	Court	Y	Safety and Security
US District Court	100 State St	Rochester (C)	Court	Y	Safety and Security
Monroe County Jail	130 S Plymouth Ave	Rochester (C)	Correctional Facility	Y	Safety and Security
Monroe County Correctional Facility	750 E Henrietta Rd	Brighton (T)	Correctional Facility	Y	Safety and Security
Children's Detention Center	355 Westfall Rd	Rush (T)	Correctional Facility	Y	Safety and Security

Dam Facilities

The following table summarizes the number of dam facilities, by type, for each jurisdiction in Monroe County.

Table F-11. Dams in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Glenbrook Detention Pond B Dam	-	Penfield (T)	Dam	Y	Safety and Security
Brookville Subdivision Dam	-	Webster (T)	Dam	Y	Safety and Security
Cerame Pond Dam	-	Pittsford (T)	Dam	Y	Safety and Security
Rudy/dibella Waterski Lake Dam	-	Penfield (T)	Dam	Y	Safety and Security
Willow Pond Dam	-	Perinton (T)	Dam	Y	Safety and Security
Glenbrook Detention Pond A Dam	-	Penfield (T)	Dam	Y	Safety and Security
George Rath Pond Dam	-	Hamlin (T)	Dam	Y	Safety and Security







Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
A Gioia & Sons Pond Dam	-	Parma (T)	Dam	Y	Safety and Security
Harold Skutt Pond Dam	-	Hamlin (T)	Dam	Y	Safety and Security
Harold Feil Pond Dam	-	Parma (T)	Dam	Y	Safety and Security
One Man Dam	-	Chili (T)	Dam	Y	Safety and Security
Sincon Mill Dam	_	Perinton (T)	Dam	Y	Safety and Security
Lawless Paper Mill Dam	-	Penfield (T)	Dam	Y	Safety and Security
B Valvano Pond Dam	_	Perinton (T)	Dam	Y	Safety and Security
R W Holmes Pond Dam	-	Perinton (T)	Dam	Y	Safety and Security
Elmer Welke Dam	-	Webster (T)	Dam	Y	Safety and Security
Paul E Turner Dam	-	Penfield (T)	Dam	Y	Safety and Security
Stanndco Developers Inc Dam	-	Penfield (T)	Dam	Y	Safety and Security
Southern Hills Detention Pond Dam	-	Perinton (T)	Dam	Y	Safety and Security
Eagle Vale Golf Course Dam	-	Perinton (T)	Dam	Y	Safety and Security
Maiden Lane Detention Pond Dam	-	Greece (T)	Dam	Y	Safety and Security
Highland Park Reservoir Dam	-	Rochester (C)	Dam	Y	Safety and Security
Cobbs Hill Reservoir Dam	-	Rochester (C)	Dam	Y	Safety and Security
Rush Reservoir Dam	-	Rush (T)	Dam	Y	Safety and Security
Southeast Reservoir Dam	-	Pittsford (T)	Dam	Y	Safety and Security
Lock 33 Dam Erie Canal	-	Henrietta (T)	Dam	Y	Safety and Security
Blvd Dam	-	Irondequoit (T)	Dam	Y	Safety and Security
Allen's Creek East Branch Drainage Project Dam	-	Pittsford (T)	Dam	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Linden Tech Park Dam	-	Penfield (T)	Dam	Y	Safety and Security
Town Of Rush Dam	-	Rush (T)	Dam	Y	Safety and Security
Tompkinson, Kenyon & Tompkinson Dam	-	Honeoye Falls (V)	Dam	Y	Safety and Security
Hamilton Mill Dam	-	Honeoye Falls (V)	Dam	Y	Safety and Security
Hugh Hunter Recreational Pond Dam	-	Mendon (T)	Dam	Y	Safety and Security
Robert Wehle Marsh Dam	-	Chili (T)	Dam	Y	Safety and Security
Rudolph Speth Dam	-	Rush (T)	Dam	Y	Safety and Security
Rudolph Speth Dam	-	Rush (T)	Dam	Y	Safety and Security
L C Brown Dam	-	Chili (T)	Dam	Y	Safety and Security
W O Thackers Dam	-	Chili (T)	Dam	Y	Safety and Security
Churchville Dam	-	Churchville (V)	Dam	Y	Safety and Security
Flower City Tissue Mill Dam	-	Wheatland (T)	Dam	Y	Safety and Security
Garbutt Dam	-	Wheatland (T)	Dam	Y	Safety and Security
Gulf Milling Co Dam	-	Parma (T)	Dam	Y	Safety and Security
Ebsary-gypsum Co Dam	-	Wheatland (T)	Dam	Y	Safety and Security
M Colby Dam	-	Ogden (T)	Dam	Y	Safety and Security
Andrew Sodoma Dam	-	Sweden (T)	Dam	Y	Safety and Security
Emanuel Paxhia Dam	-	Chili (T)	Dam	Y	Safety and Security
Theodore Burnett Dam	-	Greece (T)	Dam	Y	Safety and Security
Coleman Dam	-	Wheatland (T)	Dam	Y	Safety and Security
L H Gardner Paper Co Dam	-	Wheatland (T)	Dam	Y	Safety and Security
John Wehle Dam	-	Wheatland (T)	Dam	Y	Safety and Security
Rochester Gas & Electric Corp Dam	-	Rochester (C)	Dam	Y	Safety and Security
Rochester Gas & Electric Corp Dam	-	Rochester (C)	Dam	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Station #5 Dam	-	Rochester (C)	Dam	Y	Safety and Security
Johnson Seymore Dam	-	Rochester (C)	Dam	Y	Safety and Security
Central Avenue Dam (station # 2)	-	Rochester (C)	Dam	Y	Safety and Security
Court Street Dam	-	Rochester (C)	Dam	Y	Safety and Security
Sherry Milling Company Dam	-	Penfield (T)	Dam	Y	Safety and Security
Barnes Mill Dam	-	Brighton (T)	Dam	Y	Safety and Security
E M Trimble Dam	-	Irondequoit (T)	Dam	Y	Safety and Security
Arthur B Treman Pond Dam	-	Mendon (T)	Dam	Y	Safety and Security
F G Snyder Pond Dam	-	Pittsford (T)	Dam	Y	Safety and Security
Dumpling Hill Dam	-	Chili (T)	Dam	Y	Safety and Security
Remelt Marsh Dam	-	Wheatland (T)	Dam	Y	Safety and Security
Lewis Case Marsh Dam	-	Mendon (T)	Dam	у	Safety and Security
Philip Wilson Dam	-	Henrietta (T)	Dam	Y	Safety and Security
Tinker Homestead & Farm Museum Park Dam	-	Henrietta (T)	Dam	Y	Safety and Security
Wham Radio Station Pond Dam	-	Chili (T)	Dam	Y	Safety and Security
Lewis Case Dam	-	Mendon (T)	Dam	Y	Safety and Security
Larkin Creek Dam	-	Greece (T)	Dam	Y	Safety and Security
Round Pond Creek Dam	-	Greece (T)	Dam	Y	Safety and Security
Stonewood Village Realty Dam	-	Henrietta (T)	Dam	Y	Safety and Security
English Road Detention Facility Dam	-	Greece (T)	Dam	Y	Safety and Security
Gifford-cowles & Schoenberger Dam	-	Pittsford (T)	Dam	Y	Safety and Security
Lock 32 Dam Erie Canal	-	Pittsford (T)	Dam	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Riverton Properties Inc Dam	-	Henrietta (T)	Dam	Y	Safety and Security
Kodak Elmgrove Detention Pond Dam	-	Gates (T)	Dam	Y	Safety and Security
John Meston Pond Dam	-	Rush (T)	Dam	Y	Safety and Security
Harper Sibley Dam	-	Mendon (T)	Dam	Y	Safety and Security
Shone & Cook Pond Dam	-	Mendon (T)	Dam	Y	Safety and Security
Parrish Pond Reservoir Dam	-	Mendon (T)	Dam	Y	Safety and Security
ODGEN HEIGHTS DAM	-	Ogden (T)	Dam	Y	Safety and Security

Education Facilities

The following table summarizes the number of education facilities, by type, for each jurisdiction in Monroe County.

Table F-12. Education Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Discovery Charter School & Young Women's College Prep	133 Hoover Drive	Greece (T)	Post-Secondary Education	Y	Safety and Security
University of Rochester	400 Elmwood Ave	Rochester (C)	Post-Secondary Education	Y	Safety and Security
Roberts Wesleyan College	2265 Westside Dr	Chili (T)	Post-Secondary Education	Y	Safety and Security
State University College at Brockport	6880 Fourth Section Road	Brockport (V)	Post-Secondary Education	Y	Safety and Security
MCC Brigton Campus	2700 Brighton Henrietta T L Road	Brighton (T)	Post-Secondary Education	Y	Safety and Security
Nazareth College of Rochester	4245 East Avenue	Pittsford (T)	Post-Secondary Education	Y	Safety and Security
St. John Fisher College	3690 East Avenue	Pittsford (T)	Post-Secondary Education	Y	Safety and Security
Empire State College	1465 Winton Road North	Irondequoit (T)	Post-Secondary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline
	2485 W Henrietta Road			Y	Category
MCC Applied Technologies Center	2483 W Henrietta Road	Brighton (T)	Post-Secondary Education	ľ	Safety and Security
MCC Downtown	321 State Street	Rochester (C)	Post-Secondary Education	Y	Safety and Security
Campus					
MetroCenter The	55 St Paul Street	Rochester (C)	Post-Secondary Education	Y	Safety and Security
College at Brockport					
Bryant & Stratton	854 Long Pond Rd	Greece (T)	Post-Secondary Education	Y	Safety and Security
College	-				
Bryant & Stratton	1225 Jefferson Rd	Henrietta (T)	Post-Secondary Education	Y	Safety and Security
College					
Medaille College	1880 S Winton Rd	Brighton (T)	Post-Secondary Education	Y	Safety and Security
University of Rochester	300 E River Rd	Brighton (T)	Post-Secondary Education	Y	Safety and Security
The College at	350 New Campus Drive	Brockport (V)	Post-Secondary Education	Y	Safety and Security
Brockport	1	1 ()	5		, , , , , , , , , , , , , , , , , , ,
University of Rochester	425 Elmwood Ave	Rochester (C)	Post-Secondary Education	Y	Safety and Security
Medical			5		5
Discovery Charter	133 Hoover Drive	Greece (T)	Post-Secondary Education	Y	Safety and Security
School & Young					
Women's College Prep					
University of Rochester	400 Elmwood Ave	Rochester (C)	Post-Secondary Education	Y	Safety and Security
Roberts Wesleyan	2265 Westside Dr	Chili (T)	Post-Secondary Education	Y	Safety and Security
College					
State University College	6880 Fourth Section Road	Brockport (V)	Post-Secondary Education	Y	Safety and Security
at Brockport		• • • •			
Hilton High School	400 East Avenue	Hilton (V)	Primary Education	Y	Food, Water, Shelter
(school)					
Rush-Henrietta 9th Gr.	2000 LeHigh Station Road	Henrietta (T)	Primary Education	Y	Food, Water, Shelter
Academy (school)					
Roth Middle School	4000 East Henrietta Road	Henrietta (T)	Primary Education	Y	Food, Water, Shelter
(school)					
Buckman Heights	550 Buckman Rd	Greece (T)	Primary Education	Y	Safety and Security
Elementary School					
Council Rock	600 Grosvenor Road	Brighton (T)	Primary Education	Y	Safety and Security
Elementary School					





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Colebrook Elementary School	210 Colebrook Dr	Irondequoit (T)	Primary Education	Y	Safety and Security
St. Lawrence School	1000 N Greece Rd	Greece (T)	Primary Education	Y	Safety and Security
French Road Elementary School	488 French Rd	Brighton (T)	Primary Education	Y	Safety and Security
Harley School	488 Clover St	Brighton (T)	Primary Education	Y	Safety and Security
Harris Hill School	2126 Penfield Road	Penfield (T)	Primary Education	Y	Safety and Security
Fairbanks Road Elementary School	175 Fairbanks Rd	Riga (T)	Primary Education	Y	Safety and Security
Wheatland-Chili Middle/Senior High School	940 North Road	Wheatland (T)	Primary Education	Y	Safety and Security
Chestnut Ridge Elementary School	3560 Chili Ave	Chili (T)	Primary Education	Y	Safety and Security
Manor Elementary School	147 East Ave	Honeoye Falls (V)	Primary Education	Y	Safety and Security
Fred W. Hill Elementary School	40 Allen St	Sweden (T)	Primary Education	Y	Safety and Security
Nathaniel Rochester Community School	85 Adams St	Rochester (C)	Primary Education	Y	Safety and Security
St. Paul's School	158 East Ave	Hilton (V)	Primary Education	Y	Safety and Security
Rochester Acedemy Charter School	1777 Latta Rd	Greece (T)	Primary Education	Y	Safety and Security
St. John The Evangelist School	65 Martha Street	Spencerport (V)	Primary Education	Y	Safety and Security
Alternative Junior Senior High School	25 O Connor Road	Perinton (T)	Primary Education	Y	Safety and Security
Rochester School For The Deaf	1539 St Paul Street	Rochester (C)	Primary Education	Y	Safety and Security
North Baptist Christian School	2052 St Paul St	Rochester (C)	Primary Education	Y	Safety and Security
Northside Christian Academy	634 Hudson Ave	Rochester (C)	Primary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Rochester Academy of Seventh Day Adventists	309 Jefferson Ave	Rochester (C)	Primary Education	Y	Safety and Security
Cobblestone School	10 Prince Street	Rochester (C)	Primary Education	Y	Safety and Security
Talmudical Institute Of Upstate New York	769 Park Ave	Rochester (C)	Primary Education	Y	Safety and Security
Barclay Elementary School	40 Allen St	Sweden (T)	Primary Education	Y	Safety and Security
Ginther Elementary School	40 Allen St	Sweden (T)	Primary Education	Y	Safety and Security
A.D. Oliver Middle School	40 Allen St	Brockport (V)	Primary Education	Y	Safety and Security
Terry Taylor Elementary School	399 Ogden Parma Townline Road	Ogden (T)	Primary Education	Y	Safety and Security
Leo Bernabi Elementary School	1 Bernabi Road	Ogden (T)	Primary Education	Y	Safety and Security
Cosgrove Middle School	2749 Spencerport Road	Ogden (T)	Primary Education	Y	Safety and Security
BOCES Vocational Education Center	3599 Big Ridge Road	Ogden (T)	Primary Education	Y	Safety and Security
William C. Munn Elementary	2333 Manitou Road	Ogden (T)	Primary Education	Y	Safety and Security
Churchville-Chili Middle School	139 Fairbanks Rd	Riga (T)	Primary Education	Y	Safety and Security
Henry W. Longfellow School No. 36 ES	85 St Jacob St	Rochester (C)	Primary Education	Y	Safety and Security
Nathaniel Hawthorne School No. 25 ES	965 N Goodman St	Rochester (C)	Primary Education	Y	Safety and Security
Calvary Chapel Christian School	1772 Clifford Ave	Rochester (C)	Primary Education	Y	Safety and Security
Andrew J. Townson School No. 39 ES	145 Midland Av	Rochester (C)	Primary Education	Y	Safety and Security
St. Andrew's School	901 Portland Av	Rochester (C)	Primary Education	Y	Safety and Security
General Elwell S. Otis School No. 30 ES	36 Otis St	Rochester (C)	Primary Education	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
School of Applied Technology @ Edison	655 Colfax St	Rochester (C)	Primary Education	Y	Safety and Security
Most Precious Blood	1205 Lexington Av	Rochester (C)	Primary Education	Y	Safety and Security
School					
Our School	1161 Monroe Ave	Rochester (C)	Primary Education	Y	Safety and Security
Dewitt Road	722 Dewitt Road	Webster (T)	Primary Education	Y	Safety and Security
Elementary School			-		
Spry Middle School	119 South Ave	Webster (V)	Primary Education	Y	Safety and Security
State Road Elementary	1401 State Road	Webster (T)	Primary Education	Y	Safety and Security
School			5		5 5
Schlegel Road	1548 Schlegel Road	Webster (T)	Primary Education	Y	Safety and Security
Elementary School	-		-		
Klem Road North	1015 Klem Road	Webster (T)	Primary Education	Y	Safety and Security
Elementary School			2		, , , , , , , , , , , , , , , , , , ,
Klem Road South	1025 Klem Road	Webster (T)	Primary Education	Y	Safety and Security
Elementary School			-		
Hillel School	191 Fairfield Drive	Brighton (T)	Primary Education	Y	Safety and Security
Twelve Corners Middle	2643 Elmwood Avenue	Brighton (T)	Primary Education	Y	Safety and Security
School			-		
Seton Catholic School	165 Rhinecliff Drive	Brighton (T)	Primary Education	Y	Safety and Security
Florence Brasser	1000 Chili Center-Coldwater Road	Chili (T)	Primary Education	Y	Safety and Security
Elementary School			-		
Paul Road Elementary	571 Paul Road	Chili (T)	Primary Education	Y	Safety and Security
School			-		
St. Pius X School	3000 Chili Avenue	Chili (T)	Primary Education	Y	Safety and Security
Lois Bird and Morgan	121 East Ave	East Rochester	Primary Education	Y	Safety and Security
Elementary School		(T/V)	2		, , , , , , , , , , , , , , , , , , ,
Gates Chili Middle	2 Spartan Way	Gates (T)	Primary Education	Y	Safety and Security
School	1		2		, , , , , , , , , , , , , , , , , , ,
Neil Armstrong	3273 Lyell Road	Gates (T)	Primary Education	Y	Safety and Security
Elementary School	-		-		
Hope Hall School	1612 Buffalo Road	Gates (T)	Primary Education	Y	Safety and Security
North Star Christian	332 Spencerport Road	Gates (T)	Primary Education	Y	Safety and Security
Academy	* *		2		5 5





	Address	Iti		FEMA Designated	FEMA Lifeline
Facility Name	175 Coldwater Road	Location	Critical Facility Type	Lifeline?	Category
Walt Disney Elementary School	1/5 Coldwater Road	Gates (T)	Primary Education	-	Safety and Security
East Rochester	400 Woodbine Avenue	East Rochester	Primary Education	Y	Safety and Security
Elementary School		(T/V)	-		
Martha Brown Middle School	665 Ayrault Road	Perinton (T)	Primary Education	Y	Safety and Security
Jefferson Avenue Elementary School	303 Jefferson Ave	Perinton (T)	Primary Education	Y	Safety and Security
Allendale Columbia School	519 Allens Creek Road	Pittsford (T)	Primary Education	Y	Safety and Security
St. Louis School	11 Rand Place	Pittsford (V)	Primary Education	Y	Safety and Security
Jefferson Road Elementary School	15 School Lane	Pittsford (T)	Primary Education	Y	Safety and Security
Mendon Center Elementary School	110 Mendon Center Road	Pittsford (T)	Primary Education	Y	Safety and Security
Barker Road Middle School	75 Barker Road	Pittsford (T)	Primary Education	Y	Safety and Security
Craig Hill Elementary School	320 West Craig Hill Drive	Greece (T)	Primary Education	Y	Safety and Security
Autumn Lane Elementary School	2089 Maiden Lane	Greece (T)	Primary Education	Y	Safety and Security
Phoenix Academy	200 Alcott Road	Greece (T)	Primary Education	Y	Safety and Security
Brookside Elementary School	1144 Long Pond Road	Greece (T)	Primary Education	Y	Safety and Security
Holmes Road Elementary School	300 Holmes Road	Greece (T)	Primary Education	Y	Safety and Security
Odyssey Academy (Middle & High School)	750 Maiden Lane	Greece (T)	Primary Education	Y	Safety and Security
Longridge Elementary School	190 Longridge Avenue	Greece (T)	Primary Education	Y	Safety and Security
Greece Community Early Learning Center	1010 English Road	Greece (T)	Primary Education	Y	Safety and Security
Athena Middle School	800 Long Pond Road	Greece (T)	Primary Education	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline? Y	Category
Pine Brook Elementary School	2300 English Road	Greece (T)	Primary Education		Safety and Security
Greece Christian School	750 Long Pond Road	Greece (T)	Primary Education	Y	Safety and Security
Renaissance Academy Charter School	299 Kirk Road	Greece (T)	Primary Education	Y	Safety and Security
Paddy Hill Elementary School	1801 Latta Road	Greece (T)	Primary Education	Y	Safety and Security
Arcadia Middle School	130 Island Cottage Road	Greece (T)	Primary Education	Y	Safety and Security
Lakeshore Elementary School	1200 Latta Road	Greece (T)	Primary Education	Y	Safety and Security
English Village Elementary School	800 Tait Avenue	Greece (T)	Primary Education	Y	Safety and Security
Floyd S. Winslow Elementary School	755 Pinnacle Rd	Henrietta (T)	Primary Education	Y	Safety and Security
Good Shepherd School	3288 East Henrietta Road	Henrietta (T)	Primary Education	Y	Safety and Security
Emma E. Sherman Elementary School	50 Authors Avenue	Henrietta (T)	Primary Education	Y	Safety and Security
Charles H. Roth Middle School	4000 East Henrietta Road	Henrietta (T)	Primary Education	Y	Safety and Security
Henry V. Burger Middle School	639 Erie Station Road	Henrietta (T)	Primary Education	Y	Safety and Security
Ethel K. Fyle Elementary School	133 Vollmer Parkway	Henrietta (T)	Primary Education	Y	Safety and Security
David B. Crane Elementary School	85 Shell Edge Drive	Henrietta (T)	Primary Education	Y	Safety and Security
Guardian Angels School	2061 East Henrietta Road	Henrietta (T)	Primary Education	Y	Safety and Security
Norman Howard School	275 Pinnacle Road	Henrietta (T)	Primary Education	Y	Safety and Security
Holy Childhood School	100 Groton Parkway	Henrietta (T)	Primary Education	Y	Safety and Security
Listwood Elementary School	325 List Ave	Irondequoit (T)	Primary Education	Y	Safety and Security
Dake Middle School	350 Cooper Road	Irondequoit (T)	Primary Education	Y	Safety and Security
Briarwood Elementary School	215 Briarwood Dr	Irondequoit (T)	Primary Education	Y	Safety and Security
Christ The King School	445 King'S Highway South	Irondequoit (T)	Primary Education	Y	Safety and Security

A-36



Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Brookview Elementary School	296 Brookview Drive	Irondequoit (T)	Primary Education	Y	Safety and Security
St. Margaret Mary Elementary School	400 Rogers Parkway	Irondequoit (T)	Primary Education	Y	Safety and Security
Rogers Middle School	219 Northfield Road	Irondequoit (T)	Primary Education	Y	Safety and Security
Southlawn Elementary School	455 Rawlinson Rd	Irondequoit (T)	Primary Education	Y	Safety and Security
Ivan L. Green Elementary School	800 Brown Road	Irondequoit (T)	Primary Education	Y	Safety and Security
Laurelton-Pardee Intermediate School	600 Pardee Road	Irondequoit (T)	Primary Education	Y	Safety and Security
Durand Eastman Intermediate School	95 Point Pleasant	Irondequoit (T)	Primary Education	Y	Safety and Security
Bay Knoll Seventh Day Adventist School	2639 East Ridge Road	Irondequoit (T)	Primary Education	Y	Safety and Security
St. Joseph's School	39 Gebhardt Rd	Penfield (T)	Primary Education	Y	Safety and Security
New Covenant Christian School	2070 Five Mile Line Rd	Penfield (T)	Primary Education	Y	Safety and Security
Cobbles Elementary School	140 Gebhardt Road	Penfield (T)	Primary Education	Y	Safety and Security
Scribner Road Elementary School	1760 Scribner Road	Penfield (T)	Primary Education	Y	Safety and Security
Bay Trail Middle School	1760 Scribner Road	Penfield (T)	Primary Education	Y	Safety and Security
Plank Road North Elementary School	705 Plank Road	Penfield (T)	Primary Education	Y	Safety and Security
Plank Road South Elementary School	715 Plank Road	Penfield (T)	Primary Education	Y	Safety and Security
Johanna Perrin Middle School	85 Potter Pl	Fairport (V)	Primary Education	Y	Safety and Security
Brooks Hill Elementary School	181 Hulburt Rd	Fairport (V)	Primary Education	Y	Safety and Security
Minerva DeLand 9th Grade Center	140 Hulburt Road	Perinton (T)	Primary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Northside Elementary School	181 Hamilton Road	Perinton (T)	Primary Education	Y	Safety and Security
Dudley Elementary School	181 Hamilton Road	Perinton (T)	Primary Education	Y	Safety and Security
Thornell Road Elementary School	431 Thornell Road	Pittsford (T)	Primary Education	Y	Safety and Security
Park Road Elementary School	50 Park Road	Pittsford (T)	Primary Education	Y	Safety and Security
Holy Cross School	4488 Lake Ave	Rochester (C)	Primary Education	Y	Safety and Security
Abelard Reynolds School No. 42 ES	3330 Lake Av	Rochester (C)	Primary Education	Y	Safety and Security
Kodak Park School No. 41 ES	279 W Ridge Rd	Rochester (C)	Primary Education	Y	Safety and Security
Sacred Heart Cathedral School	311 Flower City Pk	Rochester (C)	Primary Education	Y	Safety and Security
Aquinas Institute of Rochester	1127 Dewey Ave	Rochester (C)	Primary Education	Y	Safety and Security
Virgil Grissom School No. 7 ES	31 Bryan St	Rochester (C)	Primary Education	Y	Safety and Security
Nazareth Elementary	1001 Lake Av	Rochester (C)	Primary Education	Y	Safety and Security
Dr. Louis A. Cerulli School No. 34 ES	530 Lexington Av	Rochester (C)	Primary Education	Y	Safety and Security
Cathedral School at Holy Rosary	420 Lexington Av	Rochester (C)	Primary Education	Y	Safety and Security
Roberto Clemente School No. 8 ES	1180 St Paul St	Rochester (C)	Primary Education	Y	Safety and Security
Thomas Jefferson Middle School	Edgerton Park	Rochester (C)	Primary Education	Y	Safety and Security
Early Childhood School of Rochester No. 57 ES	15 Costar St	Rochester (C)	Primary Education	Y	Safety and Security
Dr. Martin Luther King, Jr School No. 9 ES	485 N Clinton Av	Rochester (C)	Primary Education	Y	Safety and Security
Henry Lomb School School No. 20 ES	54 Oakman St	Rochester (C)	Primary Education	Y	Safety and Security



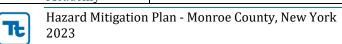


Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Lincoln School No. 22 ES	27 Zimbrich St	Rochester (C)	Primary Education	Y	Safety and Security
Helen Barrett Montgomery School No. 50 ES	301 Senica Ave	Rochester (C)	Primary Education	Y	Safety and Security
Dag Hammarskjold School No. 6 ES	595 Upper Falls Blvd	Rochester (C)	Primary Education	Y	Safety and Security
Helendale Road School	220 Hellendale Rd	Irondequoit (T)	Primary Education	Y	Safety and Security
Holy Family School	899 Jay St	Rochester (C)	Primary Education	Y	Safety and Security
Holy Trinity School	1456 Ridge Road E	Webster (T)	Primary Education	Y	Safety and Security
School of The Arts	45 Prince St	Rochester (C)	Primary Education	Y	Safety and Security
Chester Dewey School No. 14 ES	200 University Av	Rochester (C)	Primary Education	Y	Safety and Security
Audubon School No. 33 ES	500 Webster Ave	Rochester (C)	Primary Education	Y	Safety and Security
Mary Mcleod Bethune School No. 45 ES	1445 Clifford Ave	Rochester (C)	Primary Education	Y	Safety and Security
St. Ambrose School	31 Empire Blvd	Irondequoit (T)	Primary Education	Y	Safety and Security
Rochester Academy Charter School	310 Hinchey Road	Gates (T)	Primary Education	Y	Safety and Security
St. John of Rochester School	10 Wickford Way	Perinton (T)	Primary Education	Y	Safety and Security
St. Monica School	841 Genesee St	Rochester (C)	Primary Education	Y	Safety and Security
St. Rita's School	1008 Maple Dr	Webster (T)	Primary Education	Y	Safety and Security
Seneca Elementary School	4143 St Paul Blvd	Irondequoit (T)	Primary Education	Y	Safety and Security
Iroquois Middle School	150 Colebrook Dr	Irondequoit (T)	Primary Education	Y	Safety and Security
Allen Creek Elementary School	3188 East Ave	Brighton (T)	Primary Education	Y	Safety and Security
Indian Landing Elementary School	702 Landing Road N	Brighton (T)	Primary Education	Y	Safety and Security
Monica B. Leary Elementary School	5509 E Henrietta Road	Rush (T)	Primary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
T. J. Conner Elementary School	13 Beckwith Ave	Scottsville (V)	Primary Education	Y	Safety and Security
Quest Elementary School	225 West Ave	Hilton (V)	Primary Education	Y	Safety and Security
Village Elementary School	100 School Lane	Hilton (V)	Primary Education	Y	Safety and Security
Merton Williams Middle School	100 School Lane	Hilton (V)	Primary Education	Y	Safety and Security
Theodore Roosevelt School No. 43 ES	1305 Lyell Av	Rochester (C)	Primary Education	Y	Safety and Security
Enrico Fermi School No. 17 ES	158 Orchard St	Rochester (C)	Primary Education	Y	Safety and Security
John Williams School No. 5 ES	555 N Plymouth Av	Rochester (C)	Primary Education	Y	Safety and Security
Adlai E. Stevenson School No. 29 ES	88 Kirkland Rd	Rochester (C)	Primary Education	Y	Safety and Security
George Mather Forbes School No. 4 ES	198 Dr S Mccree Way	Rochester (C)	Primary Education	Y	Safety and Security
Clara Barton School No. 2 ES	190 Reynolds St	Rochester (C)	Primary Education	Y	Safety and Security
Dr. Charles T. Lunsford School No. 19 ES	465 Seward St	Rochester (C)	Primary Education	Y	Safety and Security
Joseph C. Wilson Magnet HS Foundation Academy	200 Genesee St	Rochester (C)	Primary Education	Y	Safety and Security
John Walton Spencer School No. 16 ES	321 Post Av	Rochester (C)	Primary Education	Y	Safety and Security
Lincoln Park School No. 44 ES	820 Chili Ave	Rochester (C)	Primary Education	Y	Safety and Security
James P. B. Duffy School No. 12 ES	999 South Av	Rochester (C)	Primary Education	Y	Safety and Security
St. Boniface School	15 Whalin St	Rochester (C)	Primary Education	Y	Safety and Security
School Without Walls Commencement Academy	480 Broadway	Rochester (C)	Primary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Childrens School of Rochester No. 15 ES	494 Averill Ave	Rochester (C)	Primary Education	Y	Safety and Security
Corpus Christi School	546 Oxford St	Rochester (C)	Primary Education	Y	Safety and Security
New Hope Christian Academy	3355 Union St	Chili (T)	Primary Education	Y	Safety and Security
Grace Covenant Christian School	224 Chestnut Ridge Road	Chili (T)	Primary Education	Y	Safety and Security
Christ Community Church School	36 Coleman Creek Rd	Brockport (V)	Primary Education	Y	Safety and Security
Golden Heights Christian Academy	8341 Ridge Road W	Clarkson (T)	Primary Education	Y	Safety and Security
Mary K. Vollmer Learning Center	150 Telephone Road	Henrietta (T)	Primary Education	Y	Safety and Security
Henrietta Christian School	1225 Calkins Road	Henrietta (T)	Primary Education	Y	Safety and Security
Rochester Christian School	260 Embury Road	Penfield (T)	Primary Education	Y	Safety and Security
Honeoye Falls-Lima Middle School	619 Quaker Meetinghouse Rd	Mendon (T)	Primary Education	Y	Safety and Security
Webster Christian School	675 Holt Road	Webster (T)	Primary Education	Y	Safety and Security
Webster Presbyterian Society School	550 Webster Road	Webster (T)	Primary Education	Y	Safety and Security
Halpern Day Treatment Education Center	695 Bay Road	Webster (T)	Primary Education	Y	Safety and Security
World of Inquiry School No. 58 ES	200 University Avenue	Rochester (C)	Primary Education	Y	Safety and Security
BOCES Vollmer Satellite School	639 Erie Station Road	Henrietta (T)	Primary Education	Y	Safety and Security
State Agricultural and Industrial School	375 Rush-Scottsville Road	Rush (T)	Primary Education	Y	Safety and Security
Churchville Elementary School	36 W Buffalo Street	Churchville (V)	Primary Education	Y	Safety and Security
Siena Catholic Academy	2617 East Ave	Brighton (T)	Primary Education	Y	Safety and Security

A-41



				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
North S.T.A.R. Educational Program	30 Hart Street	Rochester (C)	Primary Education	Y	Safety and Security
Bishop Hogan Catholic Academy	125 King'S Highway South	Irondequoit (T)	Primary Education	Y	Safety and Security
Bread of Life Christian Academy	2505 Browncroft Blvd	Penfield (T)	Primary Education	Y	Safety and Security
Churchville-Chili Junior High School	137 Fairbanks Rd	Riga (T)	Primary Education	Y	Safety and Security
Eugenio Maria De Hostos Charter School	938 Clifford Av	Rochester (C)	Primary Education	Y	Safety and Security
Florence S. Brown Pre- K Center	500 Webster Ave	Rochester (C)	Primary Education	Y	Safety and Security
Genesee Community Charter School	657 East Ave	Rochester (C)	Primary Education	Y	Safety and Security
New Jerusalem Christian School	269 Dartmouth St	Rochester (C)	Primary Education	Y	Safety and Security
Ninth Grade Academy	2000 Lehigh Station Road	Henrietta (T)	Primary Education	Y	Safety and Security
Industry Secure School	101 Ruder Hill Rd	Rush (T)	Primary Education	Y	Safety and Security
Ora Academy	600 East Ave	Rochester (C)	Primary Education	Y	Safety and Security
Pinnacle Lutheran School	250 Pinnacle Road	Henrietta (T)	Primary Education	Y	Safety and Security
Rochester Children & Youth Services	1111 Elmwood Ave	Rochester (C)	Primary Education	Y	Safety and Security
Willink Middle School	900 Publishers Parkway	Webster (T)	Primary Education	Y	Safety and Security
Pinnacle School No. 35 ES	194 Field St	Rochester (C)	Primary Education	Y	Safety and Security
Martin B. Anderson School No. 1 ES	85 Hillside Av	Rochester (C)	Primary Education	Y	Safety and Security
Henry Hudson School No. 28 ES	450 Humboldt St	Rochester (C)	Primary Education	Y	Safety and Security
St. John The Evangelist School	545 Humboldt St	Rochester (C)	Primary Education	Y	Safety and Security
Frank Fowler Dow School No. 52 ES	100 Farmington Rd	Rochester (C)	Primary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Charles Carroll School No. 46 ES	250 Newcastle Rd	Rochester (C)	Primary Education	Y	Safety and Security
Dr. Walter Cooper School No.10 ES	353 Congress Ave	Rochester (C)	Primary Education	Y	Safety and Security
Westfall Academy	727 Westfall Road	Brighton (T)	Primary Education	Y	Safety and Security
Destiny School for the Gifted and Talented	1876 Elmwood Ave	Brighton (T)	Primary Education	Y	Safety and Security
Montessori School of Rochester	220 Idlewood Road	Brighton (T)	Primary Education	Y	Safety and Security
Greece Montessori School	751 Long Pond Road	Greece (T)	Primary Education	Y	Safety and Security
East Irondequoit MS	155 Densmore Road	Irondequoit (T)	Primary Education	Y	Safety and Security
Archangel School	95 Stanton Ln	Irondequoit (T)	Primary Education	Y	Safety and Security
Canal View Elementary School	1 Ranger Road	Ogden (T)	Primary Education	Y	Safety and Security
Penfield Village Nursery School & Kindergarten	1862 Penfield Road	Penfield (T)	Primary Education	Y	Safety and Security
St. John Bosco School	501 S Garfield St	East Rochester (T/V)	Primary Education	Y	Safety and Security
School of Business, Finance & Entrepreneurship	655 Colfax St	Rochester (C)	Primary Education	Y	Safety and Security
SCHOOL OF ENGNRG & MFG @ EDISON	655 Colfax St	Rochester (C)	Primary Education	Y	Safety and Security
Inter. Finance & Economic Dev. HS @ Franklin	950 Norton St	Rochester (C)	Primary Education	Y	Safety and Security
SCH OF IMAGNG & INFO TECH-EDISON	655 Colfax St	Rochester (C)	Primary Education	Y	Safety and Security
School Without Walls Foundation Academy	107 N Clinton Ave	Rochester (C)	Primary Education	Y	Safety and Security
Elohim Bible Academy	8 Mark St	Rochester (C)	Primary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Urban Choice Charter School	545 Humboldt St	Rochester (C)	Primary Education	Y	Safety and Security
TRUE NORTH ROCHESTER PREP CHARTER	630 Brooks Ave	Rochester (C)	Primary Education	Y	Safety and Security
Mary Cariola Childrens Center	1000 Elmwood Ave	Rochester (C)	Primary Education	Y	Safety and Security
Hillside Childrens Center School	1183 Monroe Ave	Rochester (C)	Primary Education	Y	Safety and Security
ROCHESTER CHILDFIRST NETWORK	941 South Ave	Rochester (C)	Primary Education	Y	Safety and Security
INDUSTRY LIMITED SECURE SCHOOL	375 Rush Scottsville Road	Rush (T)	Primary Education	Y	Safety and Security
Cornerstone Christian Academy	60 Holley St	Brockport (V)	Primary Education	Y	Safety and Security
TODDLERS' WORKSHOP KINDERGARTEN	10 May St	Webster (V)	Primary Education	Y	Safety and Security
Webster Montessori School	1310 Five Mile Line Road	Penfield (T)	Primary Education	Y	Safety and Security
Crestwood Children's Center	2075 Scottsville Road	Chili (T)	Primary Education	Y	Safety and Security
Early Childhood Center	119 Brockley Road	Irondequoit (T)	Primary Education	Y	Safety and Security
Northwood Elementary School	433 North Greece Road	Greece (T)	Primary Education	Y	Safety and Security
Calkins Road Middle School	1899 Calkins Road	Pittsford (T)	Primary Education	Y	Safety and Security
Franklin Montessori School	950 Norton St	Rochester (C)	Primary Education	Y	Safety and Security
Eugenio Maria De Hostos Charter School	1069 Joseph Ave	Rochester (C)	Primary Education	Y	Safety and Security
Flower City School No. 54 ES	311 Flower City Parkway	Rochester (C)	Primary Education	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
I'M READY	2 Austin St	Rochester (C)	Primary Education	Y	Safety and Security
Community Learning					
Center					
BioScience & Health	950 Norton St	Rochester (C)	Primary Education	Y	Safety and Security
Careers HS @ Franklin		$\mathbf{D} = 1 + 1 \mathbf{C}$		Y	
Office of Adult &	30 Hart Street	Rochester (C)	Primary Education	Y	Safety and Security
Continuing Education Services					
Rochester Academy	841 Genesee St	Rochester (C)	Primary Education	Y	Safety and Security
Charter School	off Genesee St	Roenester (C)	Timary Education	1	Safety and Security
Rochester Institute of	1 Lomb Memorial Drive	Henrietta (T)	Primary Education	Y	Safety and Security
Technology	1 20000 000000 20000	(1)		-	
Colgate Rochester	1100 S Goodman St	Rochester (C)	Primary Education	Y	Safety and Security
Divinity School			2		
Rochester Academy of	1441 East Avenue	Rochester (C)	Primary Education	Y	Safety and Security
Medicine					
Eastman School of	26 Gibbs St	Rochester (C)	Primary Education	Y	Safety and Security
Music					
St. Bernard Institude	120 French Rd	Pittsford (T)	Primary Education	Y	Safety and Security
Greece Central School	750 Maiden Lane	Greece (T)	Primary Education	Y	Safety and Security
District					~
Rochester City School	131 West Broad St	Rochester (C)	Primary Education	Y	Safety and Security
District Honeoye Falls-Lima	83 East Ave	II		Y	
Honeoye Fails-Lima High School	83 East Ave	Honeoye Falls (V)	Secondary Education	Ŷ	Safety and Security
Our Lady of Mercy	1437 Blossom Road	Brighton (T)	Secondary Education	Y	Safety and Security
High School	1157 Diossoni Roud	Dirgition (1)	Secondary Education	1	Safety and Security
Brockport High School	40 Allen St	Sweden (T)	Secondary Education	Y	Safety and Security
EJ Wilson High School	2707 Spencerport Road	Ogden (T)	Secondary Education	Y	Safety and Security
Churchville-Chili	5786 E Buffalo Rd	Riga (T)	Secondary Education	Y	Safety and Security
Senior High School			,		
Dr. Freddie Thomas	625 Scio St	Rochester (C)	Secondary Education	Y	Safety and Security
High School			•		
Arcadia High School	120 Island Cottage Road	Greece (T)	Secondary Education	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Athena High School	800 Long Pond Road	Greece (T)	Secondary Education	Y	Safety and Security
Schroeder High School	875 Ridge Road	Webster (T)	Secondary Education	Y	Safety and Security
Thomas High School	800 Five Mile Line Road	Webster (T)	Secondary Education	Y	Safety and Security
McQuaid Jesuit High School	1800 South Clinton Avenue	Brighton (T)	Secondary Education	Y	Safety and Security
Brighton High School	1150 Winton Rd S	Brighton (T)	Secondary Education	Y	Safety and Security
Gates Chili High School	1 Spartan Way	Gates (T)	Secondary Education	Y	Safety and Security
Fairport Senior High School	1 Dave Paddock Way	Perinton (T)	Secondary Education	Y	Safety and Security
Pittsford Sutherland High School	55 Sutherland Street	Pittsford (V)	Secondary Education	Y	Safety and Security
Olympia High School	1139 Maiden Lane	Greece (T)	Secondary Education	Y	Safety and Security
Rush-Henrietta Senior High School	1799 Lehigh Station Road	Henrietta (T)	Secondary Education	Y	Safety and Security
Irondequoit High School	260 Cooper Road	Irondequoit (T)	Secondary Education	Y	Safety and Security
Bishop Kearney High School	125 King'S Highway South	Irondequoit (T)	Secondary Education	Y	Safety and Security
Eastridge High School	2350 East Ridge Road	Irondequoit (T)	Secondary Education	Y	Safety and Security
Penfield Senior High School	High School Dr	Penfield (T)	Secondary Education	Y	Safety and Security
Pittsford Mendon High School	472 Mendon Road	Pittsford (T)	Secondary Education	Y	Safety and Security
Charlotte High School	4115 Lake Av	Rochester (C)	Secondary Education	Y	Safety and Security
John Marshall High School	180 Ridgeway Ave	Rochester (C)	Secondary Education	Y	Safety and Security
Hilton High School	400 East Ave	Hilton (V)	Secondary Education	Y	Safety and Security
James Monroe High School	164 Alexander St	Rochester (C)	Secondary Education	Y	Safety and Security
Charles G. Finney High School	2074 Five Mile Line Road	Penfield (T)	Secondary Education	Y	Safety and Security
BOCES Alternative High School at Burger	639 Erie Station Road	Henrietta (T)	Secondary Education	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
East Rochester High School	200 Woodbine Avenue	East Rochester (T/V)	Secondary Education	Y	Safety and Security
East High School	1801 E Main St	Rochester (C)	Secondary Education	Y	Safety and Security
Northeast College Prep High School @ Douglas	940 Fernwood Park	Rochester (C)	Secondary Education	Y	Safety and Security
Global Media Arts High School @ Feanklin	950 Norton St	Rochester (C)	Secondary Education	Y	Safety and Security
Joseph C. Wilson Magnet High School Academy	501 Genesee St	Rochester (C)	Secondary Education	Y	Safety and Security
Northwest College Prep High School @ Douglas	940 Fernwood Park	Rochester (C)	Secondary Education	Y	Safety and Security
Young Adult Evening High School	625 Scio St	Rochester (C)	Secondary Education	Y	Safety and Security
Career Schools at Benjamin Franklin High School	950 Norton St	Rochester (C)	Secondary Education	Y	Safety and Security

Energy Facilities

The following table summarizes the number of energy facilities, by type, for each jurisdiction in Monroe County.

Table F-13. Energy Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
RG&E Control Center	700 Jefferson Road	Henrietta (T)	Electric Facility	Y	Energy
RG&E	1300 Scottsville Road	Chili (T)	Electric Facility	Y	Energy
Wheatland 2A 2B	1190 (2B) /1192 (2A) Scottsville Mumfor*	Wheatland (T)	Electric Facility	Y	Energy
Village of Churchville Electric Substation	54 Sanford Rd S	Churchville (V)	Electric Facility	Y	Energy
Village of Churchville Electric Substation	54 Sanford Rd N Village of Churchville *	Churchville (V)	Electric Facility	Y	Energy





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Rochester Gas and Electric Rusl	1101 Beach Ave	Greece (T)	Gas Facility	Y	Energy
Rochester Gas and Eletre Contrl	400 West Ave	Rochester (C)	Gas Facility	Y	Energy
Wheatland Solar 2A & 2B	1190 (2B) /1192 (2A) Scottsville Mumfor*	Wheatland (T)	Large Scale Solar Farm	Y	Energy
Rochester Terminal	1075 Chili Ave	Rochester (C)	Oil	Y	Energy
North Albany Terminal	1935 Lyell Ave	Gates (T)	Oil	Y	Energy
Buckeye Terminals, LLC	754 Brooks Ave	Rochester (C)	Oil	Y	Energy
Hess Rochester Lyell	1975 Lyell Ave	Gates (T)	Oil	Y	Energy

Emergency Facilities

The following table summarizes the number of emergency facilities, by type, for each jurisdiction in Monroe County.

Table F-14. Emergency Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
County EOC	1190 Scottsville Rd.	Rochester (C)	EOC	Y	Safety and Security
Kodak Fire Department	8 Imaging Way	Rochester (C)	Fire	Y	Safety and Security
Webster Fire Department	35 South Ave	Webster (V)	Fire	Y	Safety and Security
Ridge Road Fire Department	200 Stoneridge Dr	Greece (T)	Fire	Y	Safety and Security
Gates-Chili Fire Department	22 Coldwater Road	Gates (T)	Fire	Y	Safety and Security
Spencerport Fire Department	5029 Ridge Road	Parma (T)	Fire	Y	Safety and Security
Mendon Fire Department	101 Mendon Ionia Road	Mendon (T)	Fire	Y	Safety and Security
Lake Shore Fire Department	1 Long Pond Road	Greece (T)	Fire	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Point Pleasant Fire Department	55 Ewer Ave	Irondequoit (T)	Fire	Y	Safety and Security
Fairport Fire Department	1105 Whitney Road E	Fairport (V)	Fire	Y	Safety and Security
West Webster Fire Department	437 Backus Road	Webster (T)	Fire	Y	Safety and Security
Rochester Fire Department / PSTF	1190 Scottsville Road	Rochester (C)	Fire	Y	Safety and Security
West Webster Fire Department	1051 Gravel Road	Webster (T)	Fire	Y	Safety and Security
Brighton Fire Department	429 Clover St	Brighton (T)	Fire	Y	Safety and Security
Penfield Fire Department	1760 Qualtrough Road	Penfield (T)	Fire	Y	Safety and Security
Ridge Road Fire Department	1299 Long Pond Road	Greece (T)	Fire	Y	Safety and Security
Rochester Fire Department	1477 Dewey Ave	Rochester (C)	Fire	Y	Safety and Security
Union Hill Fire Department	155 Monroe Wayne County Line Road	Webster (T)	Fire	Y	Safety and Security
Henrietta Fire Department	9 River View Dr	Henrietta (T)	Fire	Y	Safety and Security
St Paul Fire Department	433 Cooper Road	Irondequoit (T)	Fire	Y	Safety and Security
Spencerport Fire District - Station #3	2588 Union Street	Ogden (T)	Fire	Y	Safety and Security
Penfield Fire Department	2514 Penfield Road	Penfield (T)	Fire	Y	Safety and Security
St Paul Fire Department	493 Washington Ave	Irondequoit (T)	Fire	Y	Safety and Security
Hilton Fire Department	120 Old Hojack Lane	Hilton (V)	Fire	Y	Safety and Security
Henrietta Fire Department	60 Erie Station Road	Henrietta (T)	Fire	Y	Safety and Security
Rochester Fire Department	704 Hudson Ave	Rochester (C)	Fire	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Henrietta Fire	3129 E Henrietta Road	Henrietta (T)	Fire	Y	Safety and Security
Department	5129 E Hennetta Koad	filemietta (1)	ГПС	I	Safety and Security
Kodak Fire Department	606 Kodak Park Ave	Greece (T)	Fire	Y	Safety and Security
Spencerport Fire Department	175 Lyell Ave	Spencerport (V)	Fire	Y	Safety and Security
Webster Fire Department	1391 Salt Road	Penfield (T)	Fire	Y	Safety and Security
Gates-Chili Fire Department	2215 Long Pond Road	Gates (T)	Fire	Y	Safety and Security
Lake Shore Fire Department	545 Ling Road	Greece (T)	Fire	Y	Safety and Security
Rochester Fire Department	450 Lyell Ave	Rochester (C)	Fire	Y	Safety and Security
Walker Fire Department	1420 Walker Lake Ontario Road	Hamlin (T)	Fire	Y	Safety and Security
Penfield Fire Department	1838 Penfield Road	Penfield (T)	Fire	Y	Safety and Security
Rochester Fire Department	315 Monroe Ave	Rochester (C)	Fire	Y	Safety and Security
Pittsford Fire Department	465 Mendon Road	Pittsford (T)	Fire	Y	Safety and Security
Rochester Fire Department	1261 South Ave	Rochester (C)	Fire	Y	Safety and Security
Henrietta Fire Department	230 Pinnacle Road	Henrietta (T)	Fire	Y	Safety and Security
Henrietta Fire Department	774 Erie Station Road	Henrietta (T)	Fire	Y	Safety and Security
Henrietta Fire Department	850 Bailey Road	Henrietta (T)	Fire	Y	Safety and Security
Ridge-Culver Fire Department	2960 Culver Road	Irondequoit (T)	Fire	Y	Safety and Security
Sea Breeze Fire Department	4657 Culver Road	Irondequoit (T)	Fire	Y	Safety and Security
West Brighton Fire Department	2695 W Henrietta Road	Brighton (T)	Fire	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Point Pleasant Fire Department	257 Kings Hwy N	Irondequoit (T)	Fire	Y	Safety and Security
West Brighton Fire Department	41 Riverside Dr	Brighton (T)	Fire	Y	Safety and Security
Rush Fire Department	2 Rush West Rush Road	Rush (T)	Fire	Y	Safety and Security
Rochester Fire Department	185 Exchange Blvd	Rochester (C)	Fire	Y	Safety and Security
Hamlin Fire Department	1521 Lake Road	Hamlin (T)	Fire	Y	Safety and Security
Gates-Chili Fire Department	2355 Chili Ave	Gates (T)	Fire	Y	Safety and Security
Morton Fire Department	1094 Monroe Orleans County Line Road	Hamlin (T)	Fire	Y	Safety and Security
West Webster Fire Department	880 Plank Road	Penfield (T)	Fire	Y	Safety and Security
North Greece Fire Department	2030 English Road	Greece (T)	Fire	Y	Safety and Security
Laurelton Fire Department	405 Empire Blvd	Irondequoit (T)	Fire	Y	Safety and Security
North Greece Fire Department	1766 Latta Road	Greece (T)	Fire	Y	Safety and Security
Rochester Fire Department	1051 Emerson St	Rochester (C)	Fire	Y	Safety and Security
Chili Fire Department	2856 Chili Ave	Chili (T)	Fire	Y	Safety and Security
Barnard Fire Department	3084 Dewey Ave	Greece (T)	Fire	Y	Safety and Security
Rochester Fire Department	1215 N Clinton Ave	Rochester (C)	Fire	Y	Safety and Security
Brockport Fire Department	191 West Ave	Brockport (V)	Fire	Y	Safety and Security
East Rochester Fire Department	415 Main St	East Rochester (T/V)	Fire	Y	Safety and Security
Rochester Fire Department	317 Main St	East Rochester (T/V)	Fire	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Churchville Fire Department	24 Washington St	Churchville (V)	Fire	Y	Safety and Security
Rush Fire Department	1971 Rush Mendon Road	Rush (T)	Fire	Y	Safety and Security
Brockport Fire Department	38 Market St	Brockport (V)	Fire	Y	Safety and Security
St. John Bosco School	645 N Greece Road	Greece (T)	Fire	Y	Safety and Security
Town of East Rochester Court	317 Main St	Rochester (C)	Fire	Y	Safety and Security
Chili Fire Department	15 Circle Dr	Chili (T)	Fire	Y	Safety and Security
Brighton Fire Department	111 W Elm St	East Rochester (T/V)	Fire	Y	Safety and Security
Rochester Fire Department	57 Gardiner Ave	Rochester (C)	Fire	Y	Safety and Security
East Rochester Town Hall	120 West Commercial Street, East Roches*	East Rochester (T/V)	Fire	Y	Safety and Security
East Rochester Community Cntr	317 Main St	East Rochester (T/V)	Fire	Y	Safety and Security
Jean Daniel Senior Center	317 Main St	East Rochester (T/V)	Fire	Y	Safety and Security
Mumford Fire Department	1013 Main St	Wheatland (T)	Fire	Y	Safety and Security
Rochester Fire Department	272 Allen St	Rochester (C)	Fire	Y	Safety and Security
Rochester Fire Department	977 University Ave	Rochester (C)	Fire	Y	Safety and Security
Rochester Fire Department	873 Genesee St	Rochester (C)	Fire	Y	Safety and Security
Brighton Fire Department	2605 Elmwood Ave	Brighton (T)	Fire	Y	Safety and Security
Mary Magdalene Church	7 Monroe St	Honeoye Falls (V)	Fire	Y	Safety and Security
New Beginnings Church of Life	7478 Pittsford Palmyra Road	Perinton (T)	Fire	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
World Mission Society Church of God	53 Wheatland Center Road	Chili (T)	Fire	Y	Safety and Security
Rochester Reformed Presbyterian Church	8 Monroe Ave	Pittsford (V)	Fire	Y	Safety and Security
East Rochester United Methodist Church	4090 Lake Ave	Rochester (C)	Fire	Y	Safety and Security
Scottsville Fire Department	385 Scottsville-Mumford Road	Scottsville (V)	Fire	Y	Safety and Security
Chili Fire Department	3310 Union St	Chili (T)	Fire	Y	Safety and Security
Bushnell's Basin Fire Department	661 Kreag Road	Perinton (T)	Fire	Y	Safety and Security
Brockport Fire Department	237 Main St	Brockport (V)	Fire	Y	Safety and Security
Rochester Fire Department	160 Wisconsin St	Rochester (C)	Fire	Y	Safety and Security
Rochester Fire Department	740 N Goodman St	Rochester (C)	Fire	Y	Safety and Security
Bushnell's Basin Fire Department	1080 Moseley Rd, Fairport, NY 14450	Perinton (T)	Fire	Y	Safety and Security
Rochester Fire Department (Protectives)	415 Andrews St., Rochester, NY 14604	Rochester (C)	Fire	Y	Safety and Security
Rochester Police Department	1099 Jay St	Rochester (C)	Police	Y	Safety and Security
Rochester Police Department Headquarters	185 Exchange Blvd	Rochester (C)	Police	Y	Safety and Security
New York State Troop E Rochester	1155 Scottsville Road	Chili (T)	Police	Y	Safety and Security
Rochester Police Department	630 N Clinton Ave	Rochester (C)	Police	Y	Safety and Security
Federal Bureau of Investigation	100 State St	Rochester (C)	Police	Y	Safety and Security
New York State Troop E Churchville	6460 E Buffalo Road	Riga (T)	Police	Y	Safety and Security

Hazard Mitigation Plan - Monroe County, New York 2023

Ŧŧ



Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
East Rochester Police Department	317 Main St	East Rochester (T/V)	Police	Y	Safety and Security
Brighton Police Department	2300 Elmwood Ave	Brighton (T)	Police	Y	Safety and Security
Brockport Police Department	1 Clinton St	Brockport (V)	Police	Y	Safety and Security
Fairport Police Department	31 S Main St	Fairport (V)	Police	Y	Safety and Security
Gates Police Department	1605 Buffalo Road	Gates (T)	Police	Y	Safety and Security
Greece Police Department Headquarters	3 Vince Tofany Blvd.	Greece (T)	Police	Y	Safety and Security
Irondequoit Police Department	1280 Titus Ave	Irondequoit (T)	Police	Y	Safety and Security
Ogden Police Department	269 Ogden Center Road	Ogden (T)	Police	Y	Safety and Security
Webster Police Department	1000 Ridge Road	Webster (T)	Police	Y	Safety and Security
Monroe County Sheriff Headquarters	130 S Plymouth Ave	Rochester (C)	Police	Y	Safety and Security
Monroe County Sheriff Zone C Substation	2330 Union Street	Ogden (T)	Police	Y	Safety and Security
Monroe County Sheriff Zone B Substation	245 Summit Point Dr	Henrietta (T)	Police	Y	Safety and Security
New York State Troop E Penfield	1985 Baird Road	Penfield (T)	Police	Y	Safety and Security
Rochester Police Department Tacital Unit	261 Child St	Rochester (C)	Police	Y	Safety and Security
Rochester Police Department Central Investigations	185 Exchange Blvd	Rochester (C)	Police	Y	Safety and Security
Rochester Police Department Mounted Unit	184 Verona St	Rochester (C)	Police	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Monroe County Sheriff	789 Linden Av	Pittsford (T)	Police	Y	Safety and Security
Zone A Substation				1	Survey and Security
Greece Police	500 Maiden Lane	Greece (T)	Police	Y	Safety and Security
Department Precinct 2					
Greece Police	0 Greece Ridge Center Dr	Greece (T)	Police	Y	Safety and Security
Department Greece					
Ridge Center Mall SUNY Brockport Police	117 Monroe Ave	Dreader art (V)	Police	Y	Safety and Security
Dept	117 Monroe Ave	Brockport (V)	Police	ľ	Safety and Security
Monroe County Sheriff	5575 St Paul Blvd	Rochester (C)	Police	Y	Safety and Security
Parks Unit					
Monroe County Sheriff Marine Unit	5575 St Paul Blvd	Rochester (C)	Police	Y	Safety and Security
Monroe County Sheriff	3910 Clover St	Mendon (T)	Police	Y	Safety and Security
Mounted Unit					5 5
Bomb Squad Monroe	39 West Main Street	Rochester (C)	Police	Y	Safety and Security
Со					
FBI	1200 Scottsville Road, Bldg. C	Chili (T)	Police	Y	Safety and Security
Twelve Corner MS (school)	2643 Elmwood Ave	Brighton (T)	Shelter	Y	Food, Water, Shelter
Oliver MS (school)	40 Allen Street	Brockport (V)	Shelter	Y	Food, Water, Shelter
Churchville-Chili MS (school)	139 Fairbanks Road	Riga (T)	Shelter	Y	Food, Water, Shelter
East Ridge HS (school)	2350 East Ridge Road	Irondequoit (T)	Shelter	Y	Food, Water, Shelter
East Irondequoit MS (school)	155 Densmore Road	Irondequoit (T)	Shelter	Y	Food, Water, Shelter
Durand-Eastman Intermediate (school)	600 Pardee Road	Irondequoit (T)	Shelter	Y	Food, Water, Shelter
East Roch. Union Free	220 Woodbine Avenue	East Rochester	Shelter	Y	Food, Water, Shelter
PreK - 12 Complex		(T/V)			
East Roch. Union Free	220 Woodbine Avenue	East Rochester	Shelter	Y	Food, Water, Shelter
PreK - 12 Complex		(T/V)	~1 .		
Fairport HS (school)	1 Dave Paddock Way	Irondequoit (T)	Shelter	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Minerva Leland (school)	140 Hulbert Road	Perinton (T)	Shelter	Y	Food, Water, Shelter
Johanna Perrin (school)	85 Potter Place	Fairport (V)	Shelter	Y	Food, Water, Shelter
Martha Brown (school)	665 Aryault Road	Perinton (T)	Shelter	Y	Food, Water, Shelter
Gates-Chili HS (school)	1 Spartan Way	Gates (T)	Shelter	Y	Food, Water, Shelter
Gates-Chili MS (school)	2 Spartan Way	Gates (T)	Shelter	Y	Food, Water, Shelter
Neil Armstrong Elementary (school)	3273 Lyell Road	Gates (T)	Shelter	Y	Food, Water, Shelter
Arcadia HS (school)	120 Island Cottage Road	Greece (T)	Shelter	Y	Food, Water, Shelter
Arcadia MS (school)	130 Island Cottage Road	Greece (T)	Shelter	Y	Food, Water, Shelter
Athena HS & MS (schools)	800 Long Pond Road	Greece (T)	Shelter	Y	Food, Water, Shelter
Olympia HS (school)	1139 Maiden School Lane	Greece (T)	Shelter	Y	Food, Water, Shelter
Odyssey HS (school)	750 Maiden Lane	Greece (T)	Shelter	Y	Food, Water, Shelter
Merton Williams MS (school)	200 School Lane	Hilton (V)	Shelter	Y	Food, Water, Shelter
Honeoye Falls-Lima Sr. HS (school)	83 East Street	Honeoye Falls (V)	Shelter	Y	Food, Water, Shelter
Honeoye Falls-Lima MS (school)	619 Quaker Meeting House Road	Mendon (T)	Shelter	Y	Food, Water, Shelter
Penfield HS (school)	25 High School Drive	Penfield (T)	Shelter	Y	Food, Water, Shelter
Bay Trail MS (school)	1760 Scribner Road	Penfield (T)	Shelter	Y	Food, Water, Shelter
Pittsford-Mendon HS (school)	472 Mendon Road	Pittsford (T)	Shelter	Y	Food, Water, Shelter
Pittsford-Sutherland HS (school)	55 Sutherland Street	Pittsford (V)	Shelter	Y	Food, Water, Shelter
Barker Road MS (school)	75 Barker Road	Pittsford (T)	Shelter	Y	Food, Water, Shelter
Calkins Road MS (school)	1899 Calkins Road	Pittsford (T)	Shelter	Y	Food, Water, Shelter
Burger MS (school)	639 Erie Station Road	Henrietta (T)	Shelter	Y	Food, Water, Shelter
Cosgrove MS (school)	2749 Spencerport Road	Ogden (T)	Shelter	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Webster Schroeder HS (school)	875 Ridge Road	Webster (T)	Shelter	Y	Food, Water, Shelter
Webster Thomas HS (school)	800 Five Mile Line Road	Webster (T)	Shelter	Y	Food, Water, Shelter
Spry MS (school)	119 South Avenue	Webster (V)	Shelter	Y	Food, Water, Shelter
Dake Jr. HS (school)	350 Cooper Road	Irondequoit (T)	Shelter	Y	Food, Water, Shelter
Irondeqouit HS (school)	260 Cooper Road	Irondequoit (T)	Shelter	Y	Food, Water, Shelter
Iroquois MS (school)	150 Colebrook Road	Irondequoit (T)	Shelter	Y	Food, Water, Shelter
Rogers/Southlawn MS (school)	219 Northfield Road	Irondequoit (T)	Shelter	Y	Food, Water, Shelter
Wheatland-Chili HS (school)	940 North Road	Wheatland (T)	Shelter	Y	Food, Water, Shelter
The Dome Center @ Monroe Cty Fairgrounds	2695 East Henrietta Road	Brighton (T)	Shelter	Y	Food, Water, Shelter
Public Works Bldg (Town of Henrietta)	405 Calkins Road	Henrietta (T)	Shelter	Y	Food, Water, Shelter
Penfield Community Center	1985 Baird Road	Penfield (T)	Shelter	Y	Food, Water, Shelter
Perinton Community Center	1350 Turk Hill Road	Perinton (T)	Shelter	Y	Food, Water, Shelter
Sweden Senior Center	133 State Street	Brockport (V)	Shelter	Y	Food, Water, Shelter
Brockport Free Methodist Church	6787 Fourth Section Road	Sweden (T)	Shelter	Y	Food, Water, Shelter
Union Congregational United Church	14 North Main Street	Churchville (V)	Shelter	Y	Food, Water, Shelter
Lakeview Community Church	30 Long Pond Road	Greece (T)	Shelter	Y	Food, Water, Shelter
Saint Elizabeth Ann Seton Church	3747 Brick Schoolhouse Road	Hamlin (T)	Shelter	Y	Food, Water, Shelter
Saint John Lutheran Church	1107 Lake Road/County Rd 18	Hamlin (T)	Shelter	Y	Food, Water, Shelter
Victory Baptist Church	32 Wildbriar Road	Henrietta (T)	Shelter	Y	Food, Water, Shelter
First Unitarian Church	220 Winton Road South	Rochester (C)	Shelter	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Reformation Lutheran Church	111 North Chestnut Street	Rochester (C)	Shelter	Y	Food, Water, Shelter
Webster St. Martin Lutheran Church	813 Bay Road	Webster (T)	Shelter	Y	Food, Water, Shelter
Webster Recreation Center	1350 Chiyoda Drive	Webster (T)	Shelter	Y	Food, Water, Shelter
Adams Street Recreation Center	85 Adams Street	Rochester (C)	Shelter	Y	Food, Water, Shelter
Avenue D Recreation Center	200 Avenue D	Rochester (C)	Shelter	Y	Food, Water, Shelter
Campbell Street Community Center	524 Campbell Street	Rochester (C)	Shelter	Y	Food, Water, Shelter
Carter Street Recreation Center	500 Carter Street	Rochester (C)	Shelter	Y	Food, Water, Shelter
David F. Gantt Community Center	700 North Street	Rochester (C)	Shelter	Y	Food, Water, Shelter
Edgerton Recreation Center	41 Backus Street	Rochester (C)	Shelter	Y	Food, Water, Shelter
Flint Street Community Center	271 Flint Street	Rochester (C)	Shelter	Y	Food, Water, Shelter
South Avenue Community Center	999 South Avenue	Rochester (C)	Shelter	Y	Food, Water, Shelter
Thomas P. Ryan Community Center	530 Webster Avenue	Rochester (C)	Shelter	Y	Food, Water, Shelter
Village of Churchville Office	23 E Buffalo St	Churchville (V)	Shelter	Y	Food, Water, Shelter
Village of Churchville Office	23 E Buffalo St Village of Churchville *	Churchville (V)	Shelter	Y	Food, Water, Shelter

Healthcare Facilities

The following table summarizes the number of healthcare facilities, by type, for each jurisdiction in Monroe County.





Table F-15. Healthcare Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Unity Dialysis	3379 Chili Avenue	Chili (T)	Dialysis Center	Y	Health and Medical
Unity Dialysis	3379 Chili Avenue	Chili (T)	Dialysis Center	Y	Health and Medical
Unity Dialysis	3379 Chili Avenue	Chili (T)	Dialysis Center	Y	Health and Medical
Rochester Regional Health Immediate Care - Greece .	2745 W Ridge Road	Greece (T)	Urgent Care	Y	Health and Medical
University of Rochester Urgent Care	3400 Monroe Avenue	Pittsford (T)	Urgent Care	Y	Health and Medical
Rochester Regional Health Immediate Care - Webster	1065 Ridge Road	Webster (T)	Urgent Care	Y	Health and Medical
Rochester Regional Health Immediate Care - Henrietta	2685 E Henrietta Road	Henrietta (T)	Urgent Care	Y	Health and Medical
UR Medicine Urgent Care – Greece	2047 W Ridge Road	Greece (T)	Urgent Care	Y	Health and Medical
Rochester Walk In Care	1160 Chili Avenue	Gates (T)	Urgent Care	Y	Health and Medical
Urgent Care Now	W Main St	Webster (V)	Urgent Care	Y	Health and Medical
Urgent Care by Lifetime Health	470 Long Pond Road	Greece (T)	Urgent Care	Y	Health and Medical
Five Star Urgent Care	3640-3660 Dewey Avenue	Greece (T)	Urgent Care	Y	Health and Medical
Immediate Care East	1600 Moseley Road	Perinton (T)	Urgent Care	Y	Health and Medical
UR Medicine Urgent Care – Henrietta	1300 Jefferson Road	Henrietta (T)	Urgent Care	Y	Health and Medical
Rochester Urgent Care, PLLC	2701 Culver Road	Irondequoit (T)	Urgent Care	Y	Health and Medical
UR Medicine Urgent Care – Spencerport	42 Nichols Street	Spencerport (V)	Urgent Care	Y	Health and Medical
Rochester Regional Health Immediate Care - Penfield	2226 Penfield Road	Penfield (T)	Urgent Care	Y	Health and Medical





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
UR Medicine Urgent Care – Penfield	2134 Penfield Road	Penfield (T)	Urgent Care	Y	Health and Medical
Cornerstone Urgent Care	2968 Chili Avenue	Chili (T)	Urgent Care	Y	Health and Medical
RGH Urgent Care	3170 Chili Avenue	Chili (T)	Urgent Care	Y	Health and Medical
Fresenius Medical Care	1208 Scottsville Road	Chili (T)	Urgent Care	Y	Health and Medical

Industrial Facilities

The following table summarizes the number of industrial facilities, by type, for each jurisdiction in Monroe County.

Table F-16. Industrial Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Arch (Arxada)	100 McKee Rd	Rochester (C)	Chemical	Y	Hazardous Material
Mc Alpin Industries	255 Hollenbeck St	Rochester (C)	Defense Industrial	Y	Safety and Security
Coca Cola Enterprises Bottling	123 Upper Falls Blvd	Rochester (C)	Industrial	N	-
LiDestri Foods HQ	815 Whitney Rd W	Perinton (T)	Industrial	N	-
High Falls Brewing Company	445 St Paul Street	Rochester (C)	Industrial	N	-
Sabin Metal Corporation	1647 Wheatland Center Road	Wheatland (T)	Industrial	N	-
Lidestri Foods, Inc	1020 Lee Rd	Greece (T)	Industrial	N	-

Source: Monroe County GIS 2022

Military Facilities

The following table summarizes the number of energy facilities, by type, for each jurisdiction in Monroe County.





Table F-17. Energy Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
New York Army National Guard	1500 E. Henrietta Road	Henrietta (T)	Military	Y	Safety and Security
New York Army National Guard	76 Patriot Way	Greece (T)	Military	Y	Safety and Security
New York Army National Guard	42 Patriot Way	Chili (T)	Military	Y	Safety and Security
US Army Reserve Center	1577 W Ridge road	Greece (T)	Military	Y	Safety and Security
US Army Reserve Training	2035 Goodman St N	Irondequoit (T)	Military	Y	Safety and Security
US Coast Guard Station	5500 St Paul Blvd	Rochester (C)	Military	Y	Safety and Security
US Army Reserves	49 Jetview Drive	Chili (T)	Military	Y	Safety and Security

Source: Monroe County GIS 2022

Public Works Facilities

The following table summarizes the number of public works facilities, by type, for each jurisdiction in Monroe County.

Table F-18. Public Works Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Town of Irondequoit DPW	25 North Kings Highway	Irondequoit (T)	Dept of Public Works	Y	Safety and Security
Village of Fairport DPW	15 Parker Street	Fairport (V)	Dept of Public Works	Y	Safety and Security
Town of Webster Highway Dept	1005 Picture Parkway	Webster (T)	Dept of Public Works	Y	Safety and Security
Town of Greece Hwy Dept	647 Long Pond Road	Greece (T)	Dept of Public Works	Y	Safety and Security
City of Rochester DPW	945 Mt Read Blvd	Rochester (C)	Dept of Public Works	Y	Safety and Security
Village of Hilton DPW	50 Henry Street	Hilton (V)	Dept of Public Works	Y	Safety and Security
Town of Wheatland DPW	1822 Scottsviille Mumford Rd	Wheatland (T)	Dept of Public Works	Y	Safety and Security

Hazard Mitigation Plan - Monroe County, New York 2023





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Town of Penfield DPW	1607 Jackson Road	Penfield (T)	Dept of Public Works	Y	Safety and Security
Village of Brockport DPW	38 East Avenue	Brockport (V)	Dept of Public Works	Y	Safety and Security
Town of Clarkson	3623 Lake Rd	Clarkson (T)	Dept of Public Works	Y	Safety and Security
Town of Riga DPW	6475 Buffalo Road	Riga (T)	Dept of Public Works	Y	Safety and Security
Town of Parma Hwy Dept	100 Henry St	Hilton (V)	Dept of Public Works	Y	Safety and Security
Town of Pittsford DPW	60 Golf Ave	Pittsford (T)	Dept of Public Works	Y	Safety and Security
Village of Honeoye Falls	100 Ulrich Lane	Honeoye Falls (V)	Dept of Public Works	Y	Safety and Security
Town of Hamlin DPW	91 Railroad Ave	Hamlin (T)	Dept of Public Works	Y	Safety and Security
Town of Henrietta DPW	405 Calkins Road	Henrietta (T)	Dept of Public Works	Y	Safety and Security
Town of Gates Highway Dept	475 Trabold Road	Gates (T)	Dept of Public Works	Y	Safety and Security
Village of East Rochester DPW	200 Ontario Street	East Rochester (T/V)	Dept of Public Works	Y	Safety and Security
Village of Spencerport DPW	500 West Ave	Spencerport (V)	Dept of Public Works	Y	Safety and Security
Village of Churchville	44 North Main St.	Churchville (V)	Dept of Public Works	Y	Safety and Security
Town of Rush Highway Dept	804 Rush West Rush Road	Rush (T)	Dept of Public Works	Y	Safety and Security
Town of Ogden Hwy Dept	2432 South Union Street	Ogden (T)	Dept of Public Works	Y	Safety and Security
Village of Scottsville DPW	389 Scottsville Mumford Road	Scottsville (V)	Dept of Public Works	Y	Safety and Security
Town of Sweden DPW	40 White Road	Sweden (T)	Dept of Public Works	Y	Safety and Security
Town of Mendon DPW	101 Semmel Rd	Mendon (T)	Dept of Public Works	Y	Safety and Security
Town of Perinton DPW	100 Cobb's Lane	Perinton (T)	Dept of Public Works	Y	Safety and Security
Brighton DPW	1941 Elmwood Ave	Brighton (T)	Dept of Public Works	Y	Safety and Security
Village of Pittsford DPW	Village Lane	Pittsford (V)	Dept of Public Works	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Village of Webster DPW	28 West Main Street	Webster (V)	Dept of Public Works	Y	Safety and Security
State DOT Garage	938 Linden Ave	Pittsford (T)	Dept of Public Works	Y	Safety and Security

Religious Facilities

The following table summarizes the number of religious facilities, by type, for each jurisdiction in Monroe County.

Table F-19. Religious Facilities in Monroe County

Facility Name	Address	Location	Caitigal Facility Tyma	FEMA Designated Lifeline?	FEMA Lifeline
Facility Name St Pauls Episcopal Church	25 Westminster Road	Rochester (C)	Critical Facility Type Religious Center	Y	Category Safety and Security
Carmelite Monastery	1931 Jefferson Road	Henrietta (T)	Religious Center	Y	Safety and Security
U of R Interfaith Chapel	1045 Joseph C Wilson Blvd	Rochester (C)	Religious Center	Y	Safety and Security
Abundant Life Ministries	175 Carter St	Rochester (C)	Religious Center	Y	Safety and Security
Adams Street Church Of God	230 Adams Street	Rochester (C)	Religious Center	Y	Safety and Security
Glad Tidings Church	1980 Culver Road	Irondequoit (T)	Religious Center	Y	Safety and Security
God Healing Temple	422 Remington Street	Rochester (C)	Religious Center	Y	Safety and Security
Elim Christian Fellowship	417 Alexander	Rochester (C)	Religious Center	Y	Safety and Security
Gods House Of Refuge	1290 Saint Paul St	Rochester (C)	Religious Center	Y	Safety and Security
Gods Temple Of Holy Praise	59 Prospect Street	Rochester (C)	Religious Center	Y	Safety and Security
God's Work Pentecostal Church	975 Joseph Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Goodwill Baptist Church	111 Clifton Street	Rochester (C)	Religious Center	Y	Safety and Security
Gospel Angel Spiritual Church	87 Alphonse Street	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Grace Church Of The Nazarene	2924 South Union Street	Ogden (T)	Religious Center	Y	Safety and Security
Grace Community Church Inc.	1101 Norton Street	Rochester (C)	Religious Center	Y	Safety and Security
Grace Covenant Church	224 Chestnut Ridge Road	Chili (T)	Religious Center	Y	Safety and Security
Grace Temple Church Of God	443 Scio Street	Rochester (C)	Religious Center	Y	Safety and Security
Grace United Methodist Church	121 Driving Park Ave	Rochester (C)	Religious Center	Y	Safety and Security
Grace Unity Fellowship Church	265 Clinton Avenue N	Rochester (C)	Religious Center	Y	Safety and Security
Graves CME Church	372 Flint Street	Rochester (C)	Religious Center	Y	Safety and Security
Greater Bethlehem Temple Pentacostal	40 Favor Street	Rochester (C)	Religious Center	Y	Safety and Security
Greater Refuge Worship Center	638 Brown Street	Rochester (C)	Religious Center	Y	Safety and Security
Greater Harmo Missionary Church	60 Grand Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Greater Mt Ephraim Christian Faith	465 Hawley St	Rochester (C)	Religious Center	Y	Safety and Security
Greece Assembly Of God	750 Long Pond Road	Greece (T)	Religious Center	Y	Safety and Security
Greece Baptist Church	1230 Long Pond Road	Greece (T)	Religious Center	Y	Safety and Security
Greece United Methodist Church	1924 Maiden Lane	Greece (T)	Religious Center	Y	Safety and Security
Greek Orthodox Church of the Annunc	962 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Greek Orthodox Church of the Holy Spirit	835 South Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Guardian Angels Church	2061 East Henrietta	Henrietta (T)	Religious Center	Y	Safety and Security
Harvest Time Sanctuary	836 North Good	Rochester (C)	Religious Center	Y	Safety and Security





Ea cilitze Nomo	Address	Location	Caiting I Facility Type	FEMA Designated	FEMA Lifeline
Facility Name Heart And Soul	1185 Clinton Avenue	Rochester (C)	Critical Facility Type Religious Center	Lifeline? Y	Category Safety and Security
Community Free	1185 Clinton Avenue	Kochester (C)	Keligious Center	I	Safety and Security
Methodist					
Heavenly Temple	370 Remington Street	Rochester (C)	Religious Center	Y	Safety and Security
Church				-	
Henrietta Regular	1125 Calkins Road	Henrietta (T)	Religious Center	Y	Safety and Security
Baptist Church			-		
Henrietta Wesleyan	70 Thompson Road	Henrietta (T)	Religious Center	Y	Safety and Security
Church					
Aenon Baptist Church	175 Genesee Street	Rochester (C)	Religious Center	Y	Safety and Security
Aldersgate United	4115 Dewey Avenue	Greece (T)	Religious Center	Y	Safety and Security
Methodist					
All Saints Episcopal	759 Winona Boulevard	Irondequoit (T)	Religious Center	Y	Safety and Security
Church					
Alpha Lutheran Church	1969 S Clinton Avenue	Brighton (T)	Religious Center	Y	Safety and Security
The Deaf	11.0.1.0				
Amitabha Foundation	11 Goodman Street So	Rochester (C)	Religious Center	Y	Safety and Security
Anchor Christian	375 Beaver Road	Chili (T)	Religious Center	Y	Safety and Security
Church	144 Baden St	Dealerster (C)	Delleiere Center	Y	
Antioch Baptist Church		Rochester (C)	Religious Center		Safety and Security
Ark Of Jesus	74 Columbia Ave	Rochester (C)	Religious Center	Y	Safety and Security
Ark Of The Covenant	183 Bloss Street	Rochester (C)	Religious Center	Y	Safety and Security
Cogbf					
Asbury First United Methodist	1050 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Atonement Lutheran	1900 Westfall Road	Brighton (T)	Religious Center	Y	Safety and Security
Church	1700 Westian Road	Dirgiton (1)	Religious Center	1	Safety and Security
Baber Ame Church	550 Meigs Street	Rochester (C)	Religious Center	Y	Safety and Security
Baber Ame Church	820 South Clinton Av	Rochester (C)	Religious Center	Y	Safety and Security
Bahai Center	693 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Baptist Temple Church	1101 Clover Street	Brighton (T)	Religious Center	Y	Safety and Security
Bay Knoll Seventh Day	2639 Ridge Road East	Irondequoit (T)	Religious Center	Y	Safety and Security
Church	2009 Huge Houd Dust	nonacquon (1)	itengious conter		Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Benjamin Temple Church Of God In Christ	85 Prospect Street	Rochester (C)	Religious Center	Y	Safety and Security
Beth Hakneses Hachodosh	19 Saint Regis Drive	Brighton (T)	Religious Center	Y	Safety and Security
Bethany Presbyterian Church	3000 Dewey Avenue	Greece (T)	Religious Center	Y	Safety and Security
Bethel Christian Fellowship	321 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Bethsaida Evangelical Church	321 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Biblical Counseling Center	32 Wildbriar Road	Henrietta (T)	Religious Center	Y	Safety and Security
Blessed Sacrament Church	259 Rutgers Street	Rochester (C)	Religious Center	Y	Safety and Security
Borromeo Prayer Center	3011 Dewey Avenue	Greece (T)	Religious Center	Y	Safety and Security
Breath Of Life Sda Church	1410 Clifford Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Bride Of Christ Church	654 North Goodman St	Rochester (C)	Religious Center	Y	Safety and Security
Pentecostal Miracle Church Inc.	580 Saint Paul Stree	Rochester (C)	Religious Center	Y	Safety and Security
St Peter And Pauls Church	720 W Main Street	Rochester (C)	Religious Center	Y	Safety and Security
St Phillip Missionary Baptist Church	64 Niagra St	Rochester (C)	Religious Center	Y	Safety and Security
St Pius Tenth Church	3010 Chili Avenue	Chili (T)	Religious Center	Y	Safety and Security
St Salomes Church	4282 Culver Road	Irondequoit (T)	Religious Center	Y	Safety and Security
St Stanislaus Church	34 Saint Stanislaus	Rochester (C)	Religious Center	Y	Safety and Security
St Theodores Church	168 Spencerport Road	Gates (T)	Religious Center	Y	Safety and Security
St Thomas Episcopal Church	2000 Highland Avenue	Rochester (C)	Religious Center	Y	Safety and Security
St Thomas More Church	2617 East Avenue	Brighton (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
St Thomas The Apostle Church	4536 Saint Paul Boul	Irondequoit (T)	Religious Center	Y	Safety and Security
Summerville Presbyterian Church	4845 Saint Paul Blvd	Irondequoit (T)	Religious Center	Y	Safety and Security
Tabernacle Of Faith	199 Berlin Street	Rochester (C)	Religious Center	Y	Safety and Security
Temple Beth David	3200 Saint Paul Boul	Irondequoit (T)	Religious Center	Y	Safety and Security
Temple Beth El	139 Winton Road S	Rochester (C)	Religious Center	Y	Safety and Security
Temple Brith Kodesh	2131 Elmwood Avenue	Brighton (T)	Religious Center	Y	Safety and Security
Temple Emanu-El	2956 Saint Paul Blvd	Irondequoit (T)	Religious Center	Y	Safety and Security
Temple Of God Inc.	187 Congress Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Temple Sinai	363 Penfield Road	Brighton (T)	Religious Center	Y	Safety and Security
Third Presbyterian Church	4 Meigs Street	Rochester (C)	Religious Center	Y	Safety and Security
Triedstone Baptist Church	21 Ritz Street	Rochester (C)	Religious Center	Y	Safety and Security
Trinity Church Of The Nazarene	855 Long Pond Road	Greece (T)	Religious Center	Y	Safety and Security
Trinity Covenant Church	1235 Clinton Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Trinity Emmanuel Lutheran Church	761 Elmgrove Road	Gates (T)	Religious Center	Y	Safety and Security
Trinity Emmanuel Presbyterian Church	9 Shelter Street	Rochester (C)	Religious Center	Y	Safety and Security
Trinity Episcopal Church	3450 Ridge Road West	Greece (T)	Religious Center	Y	Safety and Security
Trinity Inter Faith Church	1028 Chili Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Trinity Reformed Church	909 Landing Road Nor	Brighton (T)	Religious Center	Y	Safety and Security
Trinity South Emmanuel Ucc	1095 East Henrietta Road	Brighton (T)	Religious Center	Y	Safety and Security
Triumph The Church And Kingdom of God	1025 Clinton Avenue	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
True Saints Temple of the Apostolic	100 Brooks Avenue	Rochester (C)	Religious Center	Y	Safety and Security
True Way Missionary Baptist	703 Joseph Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Twelve Corners Presbyterian	1200 Winton Road S	Brighton (T)	Religious Center	Y	Safety and Security
Ukrainian Autocephalous Orthodox Church	3176 Saint Paul Boul	Irondequoit (T)	Religious Center	Y	Safety and Security
Ukrainian Catholic Church of the Epiphan	220 Carter Street	Rochester (C)	Religious Center	Y	Safety and Security
Ukranian Christian Pentecostal	26 Sobieski Street	Rochester (C)	Religious Center	Y	Safety and Security
New Bethel CME Church	270 Scio Street	Rochester (C)	Religious Center	Y	Safety and Security
United Methodist Church	1500 Spencerport Roa	Gates (T)	Religious Center	Y	Safety and Security
United Methodist Church Bishop	1010 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
United Missionary Baptist Church	606 Bay Street	Rochester (C)	Religious Center	Y	Safety and Security
New Life Assembly United Pentecostal	64 Calkins Road	Henrietta (T)	Religious Center	Y	Safety and Security
House of Prayer For All Nations	318 Frost Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Victory Baptist Church	32 Wildbriar Road	Henrietta (T)	Religious Center	Y	Safety and Security
Victory In The City Baptist	1326 Winton Road Nor	Irondequoit (T)	Religious Center	Y	Safety and Security
Victory Tabernace Church Inc.	889 Plymouth Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Vietnamese Buddhist Association	105 Lowden Point Roa	Greece (T)	Religious Center	Y	Safety and Security
Vineyard Christian Church	1 Favor Street	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Walk Of Life Christian Center	32 York Street	Rochester (C)	Religious Center	Y	Safety and Security
Waring Baptist Church	1921 Norton Street	Rochester (C)	Religious Center	Y	Safety and Security
Wesley United Methodist Church	2009 Dewey Avenue	Rochester (C)	Religious Center	Y	Safety and Security
West Avenue United Meth Church	56 Chili Avenue	Rochester (C)	Religious Center	Y	Safety and Security
West Side Baptist Church	3955 Mount Read Boul	Greece (T)	Religious Center	Y	Safety and Security
Westminster Presbyterian Church	216 Thurston Road	Rochester (C)	Religious Center	Y	Safety and Security
Westside Christian Fellowship	312 Fisher Road	Chili (T)	Religious Center	Y	Safety and Security
Word Of Life Christian Fellowship	3374 Winton Road S	Henrietta (T)	Religious Center	Y	Safety and Security
Zion Hill Missionary Baptist	250 Dr Samuel McCree Way	Rochester (C)	Religious Center	Y	Safety and Security
Gates Assembly Of God	4195 Lyell Road	Gates (T)	Religious Center	Y	Safety and Security
Gates Baptist Temple	4393 Lyell Road	Gates (T)	Religious Center	Y	Safety and Security
Gates Presbyterian Church	1049 Wegman Road	Gates (T)	Religious Center	Y	Safety and Security
Gates Wesleyan Church	2060 Long Pond Road	Gates (T)	Religious Center	Y	Safety and Security
Genesee Baptist Church	149 Brooks Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Genesee Park Boulevard Church	391 Genesee Park Bou	Rochester (C)	Religious Center	Y	Safety and Security
Emmanuel Missionary Baptist	60 Grove Street	Rochester (C)	Religious Center	Y	Safety and Security
Emmanuel Temple of Rochester	1 Seneca Parkway	Rochester (C)	Religious Center	Y	Safety and Security
Emmanuel United Methodist Church	925 Joseph Avenue	Rochester (C)	Religious Center	Y	Safety and Security
End Time Deliverance Miracle	144 Edinburgh Street	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
English Road Alliance Church	595 English Road	Greece (T)	Religious Center	Y	Safety and Security
Ephraim Full Gospel Christian	37 Loomis Street	Rochester (C)	Religious Center	Y	Safety and Security
Episcopal Diocese Of Rochester	935 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Faith Christian Center Inc.	1797 Clifford Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Faith Lutheran Church	2576 Browncroft Boul	Penfield (T)	Religious Center	Y	Safety and Security
Faith Tabernacle Of Prayer	717 Maple Street	Rochester (C)	Religious Center	Y	Safety and Security
Faith Temple Apostolic Church	141 Arnett Boulevard	Rochester (C)	Religious Center	Y	Safety and Security
Faith Temple Church Of God	1876 Elmwood Avenue	Brighton (T)	Religious Center	Y	Safety and Security
Faith Temple Of Living God	24 Lincoln Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Faith to Faith Fellowship A Christ	319 Browncroft Boule	Rochester (C)	Religious Center	Y	Safety and Security
First Assembly Of God	45 Jones Avenue	Rochester (C)	Religious Center	Y	Safety and Security
First Baptist Church of Rochester	175 Allens Creek Road	Brighton (T)	Religious Center	Y	Safety and Security
First Baptist Church In Chili	3182 Chili Avenue	Chili (T)	Religious Center	Y	Safety and Security
Church of Christ	1039 North Greece Ro	Greece (T)	Religious Center	Y	Safety and Security
First Born Church of the Living God	301 Scio Street	Rochester (C)	Religious Center	Y	Safety and Security
First Church Christ Scientist	237 Midtown Plaza	Rochester (C)	Religious Center	Y	Safety and Security
First Church Of Christ Scientist	440 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Northeastern Conference of Seventh Day	556 Lyell Avenue	Rochester (C)	Religious Center	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Northgate Bible Chapel	240 Mc Guire Road	Greece (T)	Religious Center	Y	Safety and Security
Northside Church Of	634 Hudson Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Christ					
Open Arms	175 Norris Drive	Rochester (C)	Religious Center	Y	Safety and Security
Metropolitan					
Community					
Our Lady Of Good	75 Ernestine Street	Rochester (C)	Religious Center	Y	Safety and Security
Counsel Church					
Our Lady Of Victory -	210 Pleasant Street	Rochester (C)	Religious Center	Y	Safety and Security
St Joseph's Church					
Our Lady Queen Of	601 Edgewood Avenue	Brighton (T)	Religious Center	Y	Safety and Security
Peace					
Our Mother Of Sorrows	5000 Mount Read Boul	Greece (T)	Religious Center	Y	Safety and Security
Church					
Outreach Temple	218 Murray Street	Rochester (C)	Religious Center	Y	Safety and Security
Church Of God					
Park Ridge Free	10 Straub Road	Greece (T)	Religious Center	Y	Safety and Security
Methodist Church					
Church of the Risen	2710 Chili Avenue	Chili (T)	Religious Center	Y	Safety and Security
Savior					
Parsells Avenue	345 Parsells Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Community Church					
Peace Baptist Church	6 Oregon Street	Rochester (C)	Religious Center	Y	Safety and Security
Pentecostal Memorial	382 Central Park	Rochester (C)	Religious Center	Y	Safety and Security
Baptist Church					
Pentecostal Christian	515 North Street	Rochester (C)	Religious Center	Y	Safety and Security
Missonry					
Pentecostal Holiness	939 Clinton Avenue N	Rochester (C)	Religious Center	Y	Safety and Security
Church					
Pentecostal Ministry	488 North Goodman St	Rochester (C)	Religious Center	Y	Safety and Security
Exodus 3 14					
Brighton Reformed	805 Blossom Road	Rochester (C)	Religious Center	Y	Safety and Security
Church					
Browncroft Baptist	420 Winton Road Nort	Rochester (C)	Religious Center	Y	Safety and Security
Church					

Hazard Mitigation Plan - Monroe County, New York 2023

Ŧŧ



Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Browncroft Community Church	2530 Browncroft Blvd	Penfield (T)	Religious Center	Y	Safety and Security
Calvary Assembly Of God	740 Marshall Road	Chili (T)	Religious Center	Y	Safety and Security
Calvary Bible Baptist Church	746 Norton Street	Rochester (C)	Religious Center	Y	Safety and Security
Calvary Chapel Of Greece	85 Kuhn Road	Greece (T)	Religious Center	Y	Safety and Security
Calvary Chapel Of Rochester	2505 Browncroft Boul	Penfield (T)	Religious Center	Y	Safety and Security
Calvary Prison Ministry Inc.	107 Walbar Street	Rochester (C)	Religious Center	Y	Safety and Security
Calvary Spiritual Church	25 Morgan Street	Rochester (C)	Religious Center	Y	Safety and Security
Calvary St Andrew Church	95 Averill Ave	Rochester (C)	Religious Center	Y	Safety and Security
Central Church Of Christ	101 Plymouth Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Charity Bible Baptist Church	220 Avenue D	Rochester (C)	Religious Center	Y	Safety and Security
Chili Presbyterian Church	3600 Chili Avenue	Chili (T)	Religious Center	Y	Safety and Security
Christ Church	141 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Christ Temple Apostolic Faith	766 West Broad Stree	Rochester (C)	Religious Center	Y	Safety and Security
Christ The Good Shepherd Lutheran Church	1000 N Winton Road	Rochester (C)	Religious Center	Y	Safety and Security
Christ The King	445 Kings Highway So	Irondequoit (T)	Religious Center	Y	Safety and Security
Faith United Methodist Church	174 Pinnacle Road	Henrietta (T)	Religious Center	Y	Safety and Security
Christian Apostolic Church	1259 North Goodman St	Rochester (C)	Religious Center	Y	Safety and Security
Christian Assembly	1165 Lyell Avenue	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
	4352 Lake Avenue			Y	
Christian Community Church		Rochester (C)	Religious Center		Safety and Security
Christian Friendship Baptist Church	165 Beckwith Road	Henrietta (T)	Religious Center	Y	Safety and Security
Church Of Christ	15 Lawson Road	Greece (T)	Religious Center	Y	Safety and Security
	285 East Henrietta Road		<u> </u>	Y	, , , , , , , , , , , , , , , , , , ,
Church Of Christ		Rochester (C)	Religious Center		Safety and Security
Church Of Divine Inspiration	27 Appleton Street	Rochester (C)	Religious Center	Y	Safety and Security
Higher Heights Church Of God	690 Goodman Street N	Rochester (C)	Religious Center	Y	Safety and Security
Church Of God	595 Frost Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Church Of God And Saints Of Christ	19 Harrison St	Rochester (C)	Religious Center	Y	Safety and Security
Slavic Evangelical Pentecostal Church	441 Wilkins Street	Rochester (C)	Religious Center	Y	Safety and Security
Church Of God Of Prophecy	1074 Portland Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Christ Tabernacle Apostolic Faith Church	206 Norton Street	Rochester (C)	Religious Center	Y	Safety and Security
Church Of Jesus Christ	16 Helena Street	Rochester (C)	Religious Center	Y	Safety and Security
Church Of Jesus Christ	1529 Winton Road N	Irondequoit (T)	Religious Center	Y	Safety and Security
Church Of Jesus Christ Of Latter-Day	604 Maple Street	Rochester (C)	Religious Center	Y	Safety and Security
Church Of Jesus Christ Of Latter-Day	1250 English Road	Greece (T)	Religious Center	Y	Safety and Security
Church Of Jesus Christ Of Latter-Day	1400 Westfall Road	Brighton (T)	Religious Center	Y	Safety and Security
Church Of Jesus Christ Of Latter-Day	275 Whipple Lane	Irondequoit (T)	Religious Center	Y	Safety and Security
Church Of Love Faith Center	700 Exchange Street	Rochester (C)	Religious Center	Y	Safety and Security
Church Of The Annunciation	1754 Norton Street	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Church Of The Ascension Episcopal	1360 Lake Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Church Of The Epiphany	3285 Buffalo Road	Gates (T)	Religious Center	Y	Safety and Security
Church Of The First Born	136 Fillmore Street	Rochester (C)	Religious Center	Y	Safety and Security
Church Of The Master Baptist	3495 Lake Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Community Bible Church	284 Andrews Street	Rochester (C)	Religious Center	Y	Safety and Security
Community Christian Church	2647 Chili Avenue	Chili (T)	Religious Center	Y	Safety and Security
Congregation Beth Hamedresh-Beth Israel	1369 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Congregation Beth Sholom	1161 Monroe Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Congregation Bnai Israel Ahavas	692 Joseph Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Cornerstone Bible Chapel	3231 Buffalo Road	Gates (T)	Religious Center	Y	Safety and Security
Corpus Christi	80 Prince Street	Rochester (C)	Religious Center	Y	Safety and Security
Covenant Orthodox Presbyterian	3201 Dewey Avenue	Greece (T)	Religious Center	Y	Safety and Security
Covenant United Methodist Chur	1124 Culver Road	Rochester (C)	Religious Center	Y	Safety and Security
St Luke Tabernacle Community Church	1261 Dewey Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Diocese Of Rochester	1150 Buffalo Road	Gates (T)	Religious Center	Y	Safety and Security
Durand United Church Of Christ	4225 Culver Road	Irondequoit (T)	Religious Center	Y	Safety and Security
Ebenezer Baptist Church	174 Thurston Road	Rochester (C)	Religious Center	Y	Safety and Security
Edgewood Free Methodist Church	250 Edgewood Avenue	Brighton (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Immanuel Baptist Church	815 Park Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Emmanuel Church Of Jesus	295 Gregory Street	Rochester (C)	Religious Center	Y	Safety and Security
First Church Of God	334 Clarissa Street	Rochester (C)	Religious Center	Y	Safety and Security
First Genesis Baptist Church	292 Hudson Avenue	Rochester (C)	Religious Center	Y	Safety and Security
First Harvest Church	401 Webster Avenue	Rochester (C)	Religious Center	Y	Safety and Security
First Pentecostal Church	116 Campbell Street	Rochester (C)	Religious Center	Y	Safety and Security
First Rochester Spanish Church of God	1173 Culver Road	Rochester (C)	Religious Center	Y	Safety and Security
First Spanish Baptist Church	1401 Dewey Avenue	Rochester (C)	Religious Center	Y	Safety and Security
First Spanish Christian Church	8 Ernst Street	Rochester (C)	Religious Center	Y	Safety and Security
First Spanish Church Nazarene	597 Goodman Street N	Rochester (C)	Religious Center	Y	Safety and Security
First Unitarian Church	220 Winton Road S	Rochester (C)	Religious Center	Y	Safety and Security
First Zion Tabernacle Church	371 Lake Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Fountain Missionary Baptist Church	402 Scio Street	Rochester (C)	Religious Center	Y	Safety and Security
Friends Religious Society of Quakers	84 Scio Street	Rochester (C)	Religious Center	Y	Safety and Security
Friendship Baptist Church	44 Columbia Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Friendship United Baptist Church	77 Seward Street	Rochester (C)	Religious Center	Y	Safety and Security
Full Gospel Tabernacle Church	614 Clifford Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Gates Alliance Church	1275 Spencerport Roa	Gates (T)	Religious Center	Y	Safety and Security
Protection Of The Mother of God Rus Orth	100 Stanford Dr	Brighton (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Reaching The World For Christ	77 Whitney Street	Rochester (C)	Religious Center	Y	Safety and Security
Redeemer Lutheran Church	1549 Dewey Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Renewal Of Life Church Of God in Christ	93 Portland Avenue	Rochester (C)	Religious Center	Y	Safety and Security
St Stephen's Episcopal Church	350 Chili Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Rochester Christian Church	3177 Lyell Road	Gates (T)	Religious Center	Y	Safety and Security
Rochester Christian Church	208 Goodman Street N	Rochester (C)	Religious Center	Y	Safety and Security
Rochester Zen Center	7 Arnold Park	Rochester (C)	Religious Center	Y	Safety and Security
Rochester baptist Church	435 Ridgeway Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Rochester bible Baptist Church	274 Merchants Road	Rochester (C)	Religious Center	Y	Safety and Security
Rock Christian Center	148 Bay Street	Rochester (C)	Religious Center	Y	Safety and Security
Rock Of Ages Spiritual Church	715 Seward Street	Rochester (C)	Religious Center	Y	Safety and Security
Sacred Heart Cathedral	296 Flower City Park	Rochester (C)	Religious Center	Y	Safety and Security
Salem Baptist Church	112 Thomas Street	Rochester (C)	Religious Center	Y	Safety and Security
Salem United Church Of Christ	60 Bittner Street	Rochester (C)	Religious Center	Y	Safety and Security
Seneca United Methodist Church	121 Scholfield Road	Irondequoit (T)	Religious Center	Y	Safety and Security
Shema Yisrael Messianic Jewish	1326 Winton Road Nor	Irondequoit (T)	Religious Center	Y	Safety and Security
Shepherds Heart Christian	45 Cedarfield Commons	Greece (T)	Religious Center	Y	Safety and Security
American Baptist Churches of the Genesee	1100 Goodman Street	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
South Presbyterian Church	4 East Henrietta Roa	Rochester (C)	Religious Center	Y	Safety and Security
Southeast Ecumenical Ministry	25 Westminster Road	Rochester (C)	Religious Center	Y	Safety and Security
Spanish Seventh Day Adventist	47 Oakman Street	Rochester (C)	Religious Center	Y	Safety and Security
Spanish Seventh Day Adventist Church	1492 Clifford Avenue	Rochester (C)	Religious Center	Y	Safety and Security
St Ambrose Church	25 Empire Blvd	Rochester (C)	Religious Center	Y	Safety and Security
St Andrews Catholic Church	923 Portland Avenue	Rochester (C)	Religious Center	Y	Safety and Security
St Anne Church	1600 Mount Hope Aven	Rochester (C)	Religious Center	Y	Safety and Security
St Anthony Of Padua Church	60 Lorimer Street	Rochester (C)	Religious Center	Y	Safety and Security
St Boniface Church	330 Gregory Street	Rochester (C)	Religious Center	Y	Safety and Security
St Bridgets Church	8 Mark Street	Rochester (C)	Religious Center	Y	Safety and Security
St Casimirs Polish National	500 Simpson Road	Irondequoit (T)	Religious Center	Y	Safety and Security
St Cecilias Church	2732 Culver Road	Irondequoit (T)	Religious Center	Y	Safety and Security
St Georges R C Lithuanian Church	545 Hudson Avenue	Rochester (C)	Religious Center	Y	Safety and Security
St Helens Church School	150 Lettington Avenu	Gates (T)	Religious Center	Y	Safety and Security
St John the Baptist Church	37 Edward Street	Rochester (C)	Religious Center	Y	Safety and Security
St John The Evangelist Church	150 Floverton Street	Rochester (C)	Religious Center	Y	Safety and Security
St John The Baptist Orthodox Church	855 Goodman Street S	Rochester (C)	Religious Center	Y	Safety and Security
St John The Evangelist Church of Greece	2400 Ridge Road West	Greece (T)	Religious Center	Y	Safety and Security
St Johns Lutheran Church Elca	800 Ridge Road East	Irondequoit (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
St Josaphats Ukrainian Church	940 Ridge Road East	Irondequoit (T)	Religious Center	Y	Safety and Security
St Judes Church	4100 Lyell Road	Gates (T)	Religious Center	Y	Safety and Security
St Lawrence Church	1000 North Greece Ro	Greece (T)	Religious Center	Y	Safety and Security
St Luke And St Simon Cyrene Episcopal	17 Fitzhugh Street S	Rochester (C)	Religious Center	Y	Safety and Security
St Margaret Mary Church	401 Rogers Parkway	Irondequoit (T)	Religious Center	Y	Safety and Security
St Mark's And St John's Episcopal Church	1245 Culver Road	Rochester (C)	Religious Center	Y	Safety and Security
St Marks Church	54 Kuhn Road	Greece (T)	Religious Center	Y	Safety and Security
St Marys Church	15 Saint Marys Place	Rochester (C)	Religious Center	Y	Safety and Security
St Matthews Lutheran Church	1015 Saint Paul Stre	Rochester (C)	Religious Center	Y	Safety and Security
St Michaels Church	124 Evergreen Street	Rochester (C)	Religious Center	Y	Safety and Security
St Monicas Church	34 Monica Street	Rochester (C)	Religious Center	Y	Safety and Security
St Nicholas Church	1492 Spencerport Roa	Gates (T)	Religious Center	Y	Safety and Security
St Paul Holiness Church	63 Thomas Street	Rochester (C)	Religious Center	Y	Safety and Security
Pentecostal Pilgrim Church of God	63 Bronson Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Peoples Ministry In Christ	534 Dewey Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Pinnacle Lutheran Church	250 Pinnacle Road	Rochester (C)	Religious Center	Y	Safety and Security
Plymouth Spiritualist Church	175 Carter Street	Rochester (C)	Religious Center	Y	Safety and Security
Prayer House Church Of God by Faith	142 Atlantic Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Presbytery Of Genesee Valley	1190 Winton Road S	Brighton (T)	Religious Center	Y	Safety and Security
Heritage Christian Homes	90 Groton Parkway	Henrietta (T)	Religious Center	Y	Safety and Security
His Branch	342 Arnett Boulevard Suite 3	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Holy Apostles Church	7 Austin Street	Rochester (C)	Religious Center	Y	Safety and Security
Holy City Church Of God In Christ	290 Norht Street	Rochester (C)	Religious Center	Y	Safety and Security
Holy Cross Church	4492 Lake Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Holy Ghost Church	230 Coldwater Road	Gates (T)	Religious Center	Y	Safety and Security
Holy Name Of Jesus Church	15 Saint Martins Way	Greece (T)	Religious Center	Y	Safety and Security
Holy Name Of Mary	580 Winton Road Nort	Rochester (C)	Religious Center	Y	Safety and Security
Holy Redeemer Church of Deliverance	361 Ames Street	Rochester (C)	Religious Center	Y	Safety and Security
Holy Rosary Church	414 Lexington Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Holy Trinity Baptist Church	397 North Street	Rochester (C)	Religious Center	Y	Safety and Security
Hope Deliverance Temple	35 Flower Street	Rochester (C)	Religious Center	Y	Safety and Security
Hope Lutheran Church	1301 Vintage Lane	Greece (T)	Religious Center	Y	Safety and Security
Powerhouse Church Of God In Christ	48 Clifton Street	Rochester (C)	Religious Center	Y	Safety and Security
Iglesia La Luz Del Mundo	200 Child Street	Rochester (C)	Religious Center	Y	Safety and Security
Immaculate Conception Church	445 Frederick Dougla	Rochester (C)	Religious Center	Y	Safety and Security
Indian Landing Lutheran Church	650 Landing Road Nor	Brighton (T)	Religious Center	Y	Safety and Security
Irondequoit Presbyterian Church	2881 Culver Road	Irondequoit (T)	Religious Center	Y	Safety and Security
Irondequoit United Church of Christ	644 Titus Avenue	Irondequoit (T)	Religious Center	Y	Safety and Security
Islamic Center Of Rochester	727 Westfall Road	Brighton (T)	Religious Center	Y	Safety and Security
Islamic Culture Center Rochester	853 Culver Road	Rochester (C)	Religious Center	Y	Safety and Security
Jefferson Avenue Seventh Day Adventist	309 Jefferson Avenue	Rochester (C)	Religious Center	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Jehovahs Witnesses Maplewood Park	880 Saint Paul St	Rochester (C)	Religious Center	Y	Safety and Security
Jehovahs Witnesses Genesee Valley	1037 Plymouth Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Jehovahs Witnesses Irondequoit	2913 Culver Road	Irondequoit (T)	Religious Center	Y	Safety and Security
Jehovahs Witnesses Ellison Park	510 Helendale Road	Irondequoit (T)	Religious Center	Y	Safety and Security
Jehovahs Witnesses Greece Congregation	4343 Mount Read Blvd	Greece (T)	Religious Center	Y	Safety and Security
Jehovahs Witnesses Henrietta	1227 Calkins Road	Henrietta (T)	Religious Center	Y	Safety and Security
John Knox Presbyterian Church	3233 West Ridge Road	Greece (T)	Religious Center	Y	Safety and Security
Lake Avenue Baptist Church	70 Ambrose Street	Rochester (C)	Religious Center	Y	Safety and Security
Lake United Methodist Church	4409 Lake Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Lakeside Presbyterian Church	75 Stutson Street	Rochester (C)	Religious Center	Y	Safety and Security
Lakeview Community Church	30 Long Pond Road	Greece (T)	Religious Center	Y	Safety and Security
Orchard Community Church	2285 Latta Road	Greece (T)	Religious Center	Y	Safety and Security
Laurelton United Presbyterian	335 Helendale Road	Irondequoit (T)	Religious Center	Y	Safety and Security
Lighthouse Bible Baptist Church	1049 Winton Road N	Rochester (C)	Religious Center	Y	Safety and Security
Liberty Temole Church Of God In Christ	144 Reynolds Street	Rochester (C)	Religious Center	Y	Safety and Security
Little Light House Church of Jesus	112 Lewis Street	Rochester (C)	Religious Center	Y	Safety and Security
True Gospel Church of God and Christ	108 Magnolia Street	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Lutheran Church of the Transfiguration	3760 Culver Road	Irondequoit (T)	Religious Center	Y	Safety and Security
Lutheran Church Incarnate Word Elca	597 East Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Lutheran Church Of Concord	485 Holmes Road	Greece (T)	Religious Center	Y	Safety and Security
Lutheran Church Of Our Saviour	2415 Chili Avenue	Gates (T)	Religious Center	Y	Safety and Security
Lutheran Church Of Peace	125 Caroline Street	Rochester (C)	Religious Center	Y	Safety and Security
Lutheran Church Reformation	111 N Chestnut St	Rochester (C)	Religious Center	Y	Safety and Security
Lutheran Church Resurrection	3736 Saint Paul Boul	Irondequoit (T)	Religious Center	Y	Safety and Security
Megiddo Church	490 Thurston Road	Rochester (C)	Religious Center	Y	Safety and Security
Memorial AME Zion Church	549 Clarissa Street	Rochester (C)	Religious Center	Y	Safety and Security
Memorial Orthodox Presbyterian Church	650 Merchants Road	Rochester (C)	Religious Center	Y	Safety and Security
North Chili United Methodist Church	2200 Westside Drive	Ogden (T)	Religious Center	Y	Safety and Security
Morning Star Missionary Baptist	899 Hudson Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Most Precious Blood Church	219 Stenson Street	Rochester (C)	Religious Center	Y	Safety and Security
Mount Olivet Baptist Church	141 Adams Street	Rochester (C)	Religious Center	Y	Safety and Security
Mount Vernon Baptist Church	351 Joseph Avenue	Rochester (C)	Religious Center	Y	Safety and Security
Mount Zion Breath Of Life Church	427 North Street	Rochester (C)	Religious Center	Y	Safety and Security
Mount Zion Progressive Missionary	131 Dr Samuel McCree Way	Rochester (C)	Religious Center	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Mount Avery Missionary Baptist Church	5 Niagara Street	Rochester (C)	Religious Center	Y	Safety and Security
Mt Carmel Church	59 Ontario Street	Rochester (C)	Religious Center	Y	Safety and Security
Mt Carmel Deliverance Center Church	14 Weld Street	Rochester (C)	Religious Center	Y	Safety and Security
Mt Nebo Church Of God	270 Merrimac Street	Rochester (C)	Religious Center	Y	Safety and Security
New Beginning Church Of God	621 Brown Street	Rochester (C)	Religious Center	Y	Safety and Security
New Bethel CME Church	270 Scio Street	Rochester (C)	Religious Center	Y	Safety and Security
The Fathers House	692 & 715 Paul Road	Chili (T)	Religious Center	Y	Safety and Security
New Faith Baptist Church	460 Clifford Avenue	Rochester (C)	Religious Center	Y	Safety and Security
New Heaven Church Of God	37 Reynolds Street	Rochester (C)	Religious Center	Y	Safety and Security
New Hope Free Methodist Church	62 N Union St	Rochester (C)	Religious Center	Y	Safety and Security
Joy Community Church	890 N Goodman Street	Rochester (C)	Religious Center	Y	Safety and Security
New Life Fellowship	330 Wellington Avenu	Rochester (C)	Religious Center	Y	Safety and Security
Word of Life Fellowship Ministry	537 Post Avenue	Rochester (C)	Religious Center	Y	Safety and Security
New Testament Christian Church	349 North Avenue	Greece (T)	Religious Center	Y	Safety and Security
Messiah Lutheran Church	4301 Mount Read Blvd	Greece (T)	Religious Center	Y	Safety and Security
Abundant Life Faith Ministries	765 Elmgrove Road	Gates (T)	Religious Center	Y	Safety and Security
Ahmadiyya Movement in Islam	1609 E Main St	Rochester (C)	Religious Center	Y	Safety and Security
Bibleway Healing Assembly	4831 W Henrietta Road	Henrietta (T)	Religious Center	Y	Safety and Security
Believers Temple	428 Ames St	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Bethesda Church of God In Christ	120 St Bridgets Dr	Rochester (C)	Religious Center	Y	Safety and Security
Bridge Builders Ministries	3690 East Ave	Pittsford (T)	Religious Center	Y	Safety and Security
Christ Episcopal Church of Pittsford	36 S Main St	Pittsford (V)	Religious Center	Y	Safety and Security
Church on the Ridge	712 Finchingfield Lane	Webster (T)	Religious Center	Y	Safety and Security
Crossroads Bible Fellowship	1225 Jefferson Road	Henrietta (T)	Religious Center	Y	Safety and Security
Crossroads Community Church	1188 Jackson Road	Penfield (T)	Religious Center	Y	Safety and Security
Damascus Road	313 Wexford Pl	Penfield (T)	Religious Center	Y	Safety and Security
Emanuel Christian Church	1721 St Paul St	Rochester (C)	Religious Center	Y	Safety and Security
Faith Refuge House of Prayer	1775 Clifford Ave	Rochester (C)	Religious Center	Y	Safety and Security
Donwntown Presbyterian Church	121 N Fitzhugh St	Rochester (C)	Religious Center	Y	Safety and Security
Glory to Glory Christian Fellowship	109 Thorndale Ter	Rochester (C)	Religious Center	Y	Safety and Security
Gurudwara of Rochester	2041 Dublin Road	Penfield (T)	Religious Center	Y	Safety and Security
Henrietta Christian Fellowship	1085 Middle Road	Henrietta (T)	Religious Center	Y	Safety and Security
Holy Jerusalem Spiritual Church	780 Hudson Ave	Rochester (C)	Religious Center	Y	Safety and Security
Immanuel Lutheran Church	131 W Main St	Webster (V)	Religious Center	Y	Safety and Security
Inner Faith Gospel Tabernacle	615 Portland Ave	Rochester (C)	Religious Center	Y	Safety and Security
Institute of Divine Metaphysical Resear	1 Whipple Lane	Irondequoit (T)	Religious Center	Y	Safety and Security
Koinonia Fellowship	500 Main St	East Rochester (T/V)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Light of the World Church	523 Central Park	Rochester (C)	Religious Center	Y	Safety and Security
Living Word Temple of Restoration	34 Stenson St	Rochester (C)	Religious Center	Y	Safety and Security
Masjid As-Sunnah	490 N Goodman St	Rochester (C)	Religious Center	Y	Safety and Security
Mision De Dios	236 Clifford Ave	Rochester (C)	Religious Center	Y	Safety and Security
Mount Mariah Missionary Baptist Church	630 Portland Ave	Rochester (C)	Religious Center	Y	Safety and Security
New Beginning Christian Community	2106 Five Mile Line Road	Penfield (T)	Religious Center	Y	Safety and Security
New Beginning Church	234 Dewey Ave	Rochester (C)	Religious Center	Y	Safety and Security
New Beginning Apostolic Faith Church	1511Dewey Ave	Rochester (C)	Religious Center	Y	Safety and Security
New Jerusalem Church of Pryer and Faith	205 Reynolds	Rochester (C)	Religious Center	Y	Safety and Security
Newsong Church of Greater Rochester	3300 Monroe Ave	Brighton (T)	Religious Center	Y	Safety and Security
Pearce Memorial F M Church	4322 Buffalo Road	Chili (T)	Religious Center	Y	Safety and Security
Perinton Community Church	636 High St Ext	Perinton (T)	Religious Center	Y	Safety and Security
Remanente Fiel	600 W Main St	Rochester (C)	Religious Center	Y	Safety and Security
St James Church	123 Whittington St	Irondequoit (T)	Religious Center	Y	Safety and Security
St Leo Church	167 Lake Ave	Hilton (V)	Religious Center	Y	Safety and Security
Salvation Army	60 Liberty Pole Way	Rochester (C)	Religious Center	Y	Safety and Security
Salvation Army:Northwest	100 West Ave	Rochester (C)	Religious Center	Y	Safety and Security
Salvation Army: Temple	915 N Clinton	Rochester (C)	Religious Center	Y	Safety and Security
Slavic Pentecostal Church	4895 W Ridge Road	Parma (T)	Religious Center	Y	Safety and Security
The Shepherd's Fold Church and Ministr	3721 Scottsville Road	Wheatland (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
The Word of the Cross Church	76 N Union St	Rochester (C)	Religious Center	Y	Safety and Security
Unique Ministries	221 Maltby St	Rochester (C)	Religious Center	Y	Safety and Security
Un Nuevo Renacimiento Pentecoste	142 Fernwood Ave	Rochester (C)	Religious Center	Y	Safety and Security
Victory Community Church	1619 Manitou Road	Parma (T)	Religious Center	Y	Safety and Security
Walnut Hill Community Church	359 W Bloomfield Road	Pittsford (T)	Religious Center	Y	Safety and Security
Webster Bible Church	675 Holt Road	Webster (T)	Religious Center	Y	Safety and Security
Westside Church of Christ	469 Lyell Ave	Rochester (C)	Religious Center	Y	Safety and Security
Holy Cross Anglican Church of NA	615 Bay Road	Webster (T)	Religious Center	Y	Safety and Security
Jesus Christ the Chief Cornerstone Minis	277 Winton Road N	Rochester (C)	Religious Center	Y	Safety and Security
Assembly of God Henrietta	1390 Pinnacle Road	Henrietta (T)	Religious Center	Y	Safety and Security
Living Hope Assembly of God	2168 Roosevelt Hwy	Hamlin (T)	Religious Center	Y	Safety and Security
Spencerport Assembly of God Church	3940 Canal Road	Ogden (T)	Religious Center	Y	Safety and Security
Webster Assembly of God	708 Hard Road	Webster (T)	Religious Center	Y	Safety and Security
East Baptist Church of Henrietta	64 Reeves Road	Henrietta (T)	Religious Center	Y	Safety and Security
Emmanuel Baptist Church	412 Hamlin Clarkson Town Line Road	Hamlin (T)	Religious Center	Y	Safety and Security
Faith Baptist Church	2954 Union Street	Ogden (T)	Religious Center	Y	Safety and Security
First Baptist Church of East Rochester	119 W Elm St	East Rochester (T/V)	Religious Center	Y	Safety and Security
First Baptist Church of Penfield	1862	Penfield (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Hope of Life Baptist Minittries	601 Jay St	Rochester (C)	Religious Center	Y	Safety and Security
North Baptist Church	2052 St Paul St	Rochester (C)	Religious Center	Y	Safety and Security
Open Door Baptist Church	350 Chili Scottsville Road	Chili (T)	Religious Center	Y	Safety and Security
Southeast Bible Baptist Church	1850 Fairport Nine Mile Point Road	Penfield (T)	Religious Center	Y	Safety and Security
Trinity Missionary Baptist Church	388 Tremont St	Rochester (C)	Religious Center	Y	Safety and Security
Union Temple Baptist Church of Rochester	49 West Ave	Rochester (C)	Religious Center	Y	Safety and Security
Walker Bible Baptist Church	1425 Walker Lake Ontario Road	Hamlin (T)	Religious Center	Y	Safety and Security
Fairport Community Baptist Church	20 E Church St	Fairport (V)	Religious Center	Y	Safety and Security
First Baptist Church of Fairport	92 S Main St	Fairport (V)	Religious Center	Y	Safety and Security
East Penfield Baptist Church	2635 Penfield Road	Penfield (T)	Religious Center	Y	Safety and Security
First Baptist Church of Brocport	124 Main St	Brockport (V)	Religious Center	Y	Safety and Security
Hilton Baptist Church	50 Lake Ave	Hilton (V)	Religious Center	Y	Safety and Security
Ogden Baptist Church	721 Washington Street	Ogden (T)	Religious Center	Y	Safety and Security
Parma Baptist Community Church	4997 W Ridge Road	Parma (T)	Religious Center	Y	Safety and Security
United Church of Pittsford	123 S Main St	Pittsford (T)	Religious Center	Y	Safety and Security
Webster Baptist Church	59 South Ave	Webster (V)	Religious Center	Y	Safety and Security
West Henrietta Baptist Church	5660 W Henrietta Road	Henrietta (T)	Religious Center	Y	Safety and Security
Friendship Bible Baptist Church	124 Railroad Ave	Hilton (V)	Religious Center	Y	Safety and Security
Pinnacle Road Baptist Church	990 Pinnacle Road	Henrietta (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Hamlin Community Baptist Church	50 Hamlin Clarkson Town Line Road	Hamlin (T)	Religious Center	Y	Safety and Security
Pittsford Baptist Church	507 Thornell Road	Pittsford (T)	Religious Center	Y	Safety and Security
Clarkson Community Church	8339 W Ridge Road	Clarkson (T)	Religious Center	Y	Safety and Security
Spencerport Bible Church	1948 N Union St	Parma (T)	Religious Center	Y	Safety and Security
Church of St Vincent De Paul	11 N Main St	Churchville (V)	Religious Center	Y	Safety and Security
Church of the Transfiguration	50 W Bloomfield Road	Pittsford (T)	Religious Center	Y	Safety and Security
Good Shepherd Church	3318 E Henrietta Road	Henrietta (T)	Religious Center	Y	Safety and Security
Holy Spirit Church	1355 Hatch Road	Penfield (T)	Religious Center	Y	Safety and Security
Holy Trinity Church	1460 Ridge Road	Webster (T)	Religious Center	Y	Safety and Security
Newman Oratory	101 Kenyon St	Brockport (V)	Religious Center	Y	Safety and Security
Our Lady of Perpetual Help	1089 Joseph Ave	Rochester (C)	Religious Center	Y	Safety and Security
St Catherine of Siena	26 Mendon Ionia Road	Mendon (T)	Religious Center	Y	Safety and Security
St Christopher's Church	3350 Union St	Chili (T)	Religious Center	Y	Safety and Security
St Elizabeth Ann Seton	3747 Brick Schoolhouse Road	Hamlin (T)	Religious Center	Y	Safety and Security
St Jerome's Church	207 Garfield St	East Rochester (T/V)	Religious Center	Y	Safety and Security
St John the Evangelist of Spencerport	55 Martha St	Spencerport (V)	Religious Center	Y	Safety and Security
St John the Evangelist Church of Roch	150 Floverton St	Rochester (C)	Religious Center	Y	Safety and Security
St Joseph's Church	43 Gebhardt Road	Penfield (T)	Religious Center	Y	Safety and Security
St Joseph's Church of Rush	1209 Rush West Rush Road	Rush (T)	Religious Center	Y	Safety and Security
St Mary of the Assumption Church	99 Main St	Scottsville (V)	Religious Center	Y	Safety and Security
St Paul's R C Church	783 Hard Road	Webster (T)	Religious Center	Y	Safety and Security
St Rita's Church	1008 Maple Dr	Webster (T)	Religious Center	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Spiritus Christi Church	121 N Fitzhugh St	Rochester (C)	Religious Center	Y	Safety and Security
Church of the	20 East Ave	Fairport (V)	Religious Center	Y	Safety and Security
Assumption			0		
Church of the	63 Mason Road	Perinton (T)	Religious Center	Y	Safety and Security
Resurrection					
Jubilee Family Worship	2090 S Clinton Ave	Brighton (T)	Religious Center	Y	Safety and Security
Center			-		
Rochester Chinese	1524 Jackson Road	Penfield (T)	Religious Center	Y	Safety and Security
Christian Church					
First Church of Christ	1104 Main St	East Rochester	Religious Center	Y	Safety and Security
Science		(T/V)			
First Church of Christ	125 W Commercial St	East Rochester	Religious Center	Y	Safety and Security
Science		(T/V)			
Church of Christ	60 Spring St	Brockport (V)	Religious Center	Y	Safety and Security
Church of Christ	1484 Calkins Road	Henrietta (T)	Religious Center	Y	Safety and Security
Southside					
New Covenant Church	1276 Clifford Ave	Rochester (C)	Religious Center	Y	Safety and Security
of God Ministries					
Living Word Church of	901 Joseph Ave	Rochester (C)	Religious Center	Y	Safety and Security
God In Christ					
Progressive Church of	384 Chili Ave	Rochester (C)	Religious Center	Y	Safety and Security
God in Christ					
Shiloh Church of God	6137 Rush Lima Road	Rush (T)	Religious Center	Y	Safety and Security
in Christ					
Tried Mission Church	210 Pennsylvania Ave	Rochester (C)	Religious Center	Y	Safety and Security
of God in Christ					
True Light Church of	362 Columbia Ave	Rochester (C)	Religious Center	Y	Safety and Security
God & Christ					
Church of Jesus Christ	100 Perinton Hills Office Park	Perinton (T)	Religious Center	Y	Safety and Security
of Latter Day	#120				
Church of Jesus Christ	4088 Lake Road	Clarkson (T)	Religious Center	Y	Safety and Security
of Latter Day					
Church of Jesus Christ	915 Culver Road	Rochester (C)	Religious Center	Y	Safety and Security
of Latter Day					





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Church of Jesus Christ of Latter Day	460 Kreag Road	Perinton (T)	Religious Center	Y	Safety and Security
St Marks Coptic Orthodox Church	530 Lehigh Station Road	Henrietta (T)	Religious Center	Y	Safety and Security
Episcopal Church of the Good Shepherd	1130 Webster Road	Webster (V)	Religious Center	Y	Safety and Security
Grace Episcopal Church	9 Browns Ave	Scottsville (V)	Religious Center	Y	Safety and Security
Incarnation Episcopal Chuch Penfield	1957 Five Mile Line Road	Penfield (T)	Religious Center	Y	Safety and Security
St George's Episcopal Church	635 Wilder Road	Parma (T)	Religious Center	Y	Safety and Security
St John's Episcopal Church	11 Episcopal Ave	Honeoye Falls (V)	Religious Center	Y	Safety and Security
St Luke's Episcopal Church	77 Country Corner Lane	Perinton (T)	Religious Center	Y	Safety and Security
St Luke's Church	14 State St	Brockport (V)	Religious Center	Y	Safety and Security
Mary Magdalene Church	1008 Main St	East Rochester (T/V)	Religious Center	Y	Safety and Security
St Peters Episcopal Church	3825 E Henrietta Road	Henrietta (T)	Religious Center	Y	Safety and Security
Evangelical Chuch of Fairport	38 E Church St	Fairport (V)	Religious Center	Y	Safety and Security
Wheatland Community Church	6746 E River Road	Rush (T)	Religious Center	Y	Safety and Security
Edgewood Free Methodiist Church	330 Monroe St	Mendon (T)	Religious Center	Y	Safety and Security
Parma Free Methodist Church	1021 Hilton Parma Corners Road	Parma (T)	Religious Center	Y	Safety and Security
Christ Community Church	36 Coleman Creek Road	Brockport (V)	Religious Center	Y	Safety and Security
The Church of Nazareth	70 Waverly Pl	Rochester (C)	Religious Center	Y	Safety and Security
Hamlin New Testament Church	2179 Lake Road	Clarkson (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Community Gospel Church	693 Browns Road	Wheatland (T)	Religious Center	Y	Safety and Security
New Beginnings Church of Life	202 E Commercial St	East Rochester (T/V)	Religious Center	Y	Safety and Security
Parma Christian Fellowship	202 Lake Ave	Hilton (V)	Religious Center	Y	Safety and Security
Pittsford Community Church	421 Marsh Road	Pittsford (T)	Religious Center	Y	Safety and Security
Ridgeland Community Church	260 Beckwith Road	Henrietta (T)	Religious Center	Y	Safety and Security
Christian Bible Church	518 N Greece Road	Greece (T)	Religious Center	Y	Safety and Security
Islamic Association of Masjid	4550 Lake Ave	Rochester (C)	Religious Center	Y	Safety and Security
Jehovahs Witnesses Fairport	1344 Moseley Road	Perinton (T)	Religious Center	Y	Safety and Security
Jehovah's Witnesses Hamlin-Spencerport	2929 Sweden Walker Road	Clarkson (T)	Religious Center	Y	Safety and Security
Jehovah's Witnesses Webster Congregation	1280 Fairport Nine Mile Road	Penfield (T)	Religious Center	Y	Safety and Security
Charity Bible Church	1794 Scottsville Mumford Road	Wheatland (T)	Religious Center	Y	Safety and Security
Bethlehem Lutheran Church	32 W Church St	Fairport (V)	Religious Center	Y	Safety and Security
Community Ministry Lutheran Mission	942 Joseph Ave	Rochester (C)	Religious Center	Y	Safety and Security
Prince of Peace Lutheran Church	6020 Pittsford Palmyra Road	Perinton (T)	Religious Center	Y	Safety and Security
Risen Christ Lutheran Church	1000 Moseley Road	Perinton (T)	Religious Center	Y	Safety and Security
St John's Lutheran Church	1107 Lake Road West Fork	Hamlin (T)	Religious Center	Y	Safety and Security
St Mark Lutheran Church	779 Erie Station road	Henrietta (T)	Religious Center	Y	Safety and Security
St Mark Lutheran Church	18 Victor Mendon Road	Mendon (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
St Paul's Lutheran Church	28 Lincoln Ave	Pittsford (V)	Religious Center	Y	Safety and Security
Trinity Lutheran Church	191 Nichols St	Spencerport (V)	Religious Center	Y	Safety and Security
St Paul Lutheran Church	158 East Ave	Hilton (V)	Religious Center	Y	Safety and Security
Bethlehem Lutheran Church of Penfield	1767 Plank Road	Penfield (T)	Religious Center	Y	Safety and Security
St Martin Evangelical Lutheran Church	813 Bay Road	Webster (T)	Religious Center	Y	Safety and Security
Rochester Area Mennonite Fellowship	111 Hillside Ave	Rochester (C)	Religious Center	Y	Safety and Security
Fairport United Methodist Church	31 W Church St	Fairport (V)	Religious Center	Y	Safety and Security
First United Methodist Church of Webster	570 Ridge Road	Webster (T)	Religious Center	Y	Safety and Security
Garland Methodist Church	3723 Sweden Walker Road	Clarkson (T)	Religious Center	Y	Safety and Security
Grace Urban Ministries	860 Dewey Ave	Rochester (C)	Religious Center	Y	Safety and Security
Hamlin United Methodist Church	1742 Lake Road	Hamlin (T)	Religious Center	Y	Safety and Security
Korean United Methodist	1274 Penfield Centre Road	Penfield (T)	Religious Center	Y	Safety and Security
Penfield United Methodist Church	1795 Baird Road	Penfield (T)	Religious Center	Y	Safety and Security
United Methodist Church of Churchville	24 W Buffalo St	Churchville (V)	Religious Center	Y	Safety and Security
Calvary Community Church of the Nazarene	4045 E Henrietta Road	Henrietta (T)	Religious Center	Y	Safety and Security
Believers by Faith Christian Center	345 Fourth St	Rochester (C)	Religious Center	Y	Safety and Security
Calvary Chapel of the West Side	2407 Union Street	Ogden (T)	Religious Center	Y	Safety and Security
Calvary Chapel of Webster	770 Basket Road	Webster (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Chapel Hill	8 Prince St	Rochester (C)	Religious Center	Y	Safety and Security
Christ Covenant Fellowship	26 Pleasant View Dr	Chili (T)	Religious Center	Y	Safety and Security
Church of Life Ministries	1751 Clifford Ave	Rochester (C)	Religious Center	Y	Safety and Security
Covenant Life Church	70 Bailey Road	Henrietta (T)	Religious Center	Y	Safety and Security
Destiny Preparation Church	3177 Latta Road	Greece (T)	Religious Center	Y	Safety and Security
First Church Divine	233 Central Park	Rochester (C)	Religious Center	Y	Safety and Security
First Ukranian Christian Church	355 High St Ext	Perinton (T)	Religious Center	Y	Safety and Security
Good News Community Church	4797 W Ridge Road	Parma (T)	Religious Center	Y	Safety and Security
The Holy Temple of Christ	335 Maple St	Rochester (C)	Religious Center	Y	Safety and Security
In Christ New Hope Ministry	155 Pinnacle Road	Henrietta (T)	Religious Center	Y	Safety and Security
Lakeshore Community Church	3651 Latta Road	Greece (T)	Religious Center	Y	Safety and Security
Marantha Christian Fellowship	259 Alexander St	Rochester (C)	Religious Center	Y	Safety and Security
New Born Fellowship Church	123 Barberry Ter	Rochester (C)	Religious Center	Y	Safety and Security
New Covenant	1350 Five Mile Line Road	Penfield (T)	Religious Center	Y	Safety and Security
New Covenant Fellowship	2070 Five Mile Line Road	Penfield (T)	Religious Center	Y	Safety and Security
Encounter Church	3355 Union St	Chili (T)	Religious Center	Y	Safety and Security
Pathway to Life Ministries	130 White St	Rochester (C)	Religious Center	Y	Safety and Security
Spreading the Good News Ministry	208 Scottsville Road	Rochester (C)	Religious Center	Y	Safety and Security
Truth Ministries	873 E Main St	Rochester (C)	Religious Center	Y	Safety and Security
Unity Christ Church	55 Prince St	Rochester (C)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Victory Fellowship Center	1018 Lyell Ave	Rochester (C)	Religious Center	Y	Safety and Security
St Dimitria Macedonian Orthodox Church	234 Telephone Road	Henrietta (T)	Religious Center	Y	Safety and Security
Church Sinai Pentecostal	473 Central Pk	Rochester (C)	Religious Center	Y	Safety and Security
Gods Holy Temple No 2	151 Central Pk	Rochester (C)	Religious Center	Y	Safety and Security
Iglesia De Cristo Misionera	1729 Clifford Ave	Rochester (C)	Religious Center	Y	Safety and Security
Iglesia De Dios Amen	167 Fulton Ave	Rochester (C)	Religious Center	Y	Safety and Security
Living Word Church	449 Chili Ave	Rochester (C)	Religious Center	Y	Safety and Security
Miracle Deliverance Faith Center	69 Whitney St	Rochester (C)	Religious Center	Y	Safety and Security
Miracle Power of Deliverance Ministry	161 Herald St	Rochester (C)	Religious Center	Y	Safety and Security
Mount Sinai Johnson Holy Temple	1713 Lyell Ave	Rochester (C)	Religious Center	Y	Safety and Security
Brighton Presbyterian Church	1775 East Ave	Rochester (C)	Religious Center	Y	Safety and Security
Christ Clarion Presbyterian	415 Thornell Road	Pittsford (T)	Religious Center	Y	Safety and Security
Dewey Ave Presbyterian Church	2009 Dewey Ave	Rochester (C)	Religious Center	Y	Safety and Security
World Mission Society Church of God	109 East Ave	East Rochester (T/V)	Religious Center	Y	Safety and Security
First Presbyterian Church Brockport	35 State St	Brockport (V)	Religious Center	Y	Safety and Security
First Presbyterian Church	27 N Main St	Honeoye Falls (V)	Religious Center	Y	Safety and Security
First Presbyterian Church of Pittsford	25 Church St	Pittsford (V)	Religious Center	Y	Safety and Security
Grace Church	919 Winton Road S	Brighton (T)	Religious Center	Y	Safety and Security





	Address	Location		FEMA Designated	FEMA Lifeline
Facility Name			Critical Facility Type	Lifeline? Y	Category
John Calvin Presbyterian Church	50 Ward Hill Road	Henrietta (T)	Religious Center		Safety and Security
Korean United	2363 Pinnacle Road	Rush (T)	Religious Center	Y	Safety and Security
Presbyterian			-		
Mendon Church	936 Cheese Factory Road	Mendon (T)	Religious Center	Y	Safety and Security
New Life Presbyterian Church	243 Rosedale St	Rochester (C)	Religious Center	Y	Safety and Security
Ogden Presbyterian Church	2400 Union St	Ogden (T)	Religious Center	Y	Safety and Security
Parkminster Presbyterian Church	2710 Chili Ave	Chili (T)	Religious Center	Y	Safety and Security
Penfield Presbyterian Church	1881 Jackson Road	Penfield (T)	Religious Center	Y	Safety and Security
Perinton Presbyterian Church	6511 Pittsford Palmyra Road	Perinton (T)	Religious Center	Y	Safety and Security
Rochester Reformed Presbyterian Church	115 East Ave	East Rochester (T/V)	Religious Center	Y	Safety and Security
Union Presbyterian Church	1 Browns Ave	Scottsville (V)	Religious Center	Y	Safety and Security
Webster Presbyterian Church	550 Webster Road	Webster (T)	Religious Center	Y	Safety and Security
Grace Baptist Church	1300 Winton Road N	Irondequoit (T)	Religious Center	Y	Safety and Security
Rochester Christian Reformed Church	2750 Atlantic Ave	Penfield (T)	Religious Center	Y	Safety and Security
Webster Christian Reformed Church	1346 State Road	Webster (T)	Religious Center	Y	Safety and Security
Reorganized Church of Jesus Christ	5611 Pittsford Palmyra Road	Pittsford (T)	Religious Center	Y	Safety and Security
General Assembly of Spiritualists	27 Appleton St	Rochester (C)	Religious Center	Y	Safety and Security
First Universalist Church of Rochester	150 S Clinton Ave	Rochester (C)	Religious Center	Y	Safety and Security
First Congregational Church	65 Church St	Spencerport (V)	Religious Center	Y	Safety and Security





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
First Congregational United Church	26 E Church St	Fairport (V)	Religious Center	Y	Safety and Security
Mountain Rise United Church of Christ	2 Mountain Rise	Perinton (T)	Religious Center	Y	Safety and Security
Riga Congregational Church]	7057 Chili Riga Center Road	Riga (T)	Religious Center	Y	Safety and Security
Union Congregational United	14 N Main St	Churchville (V)	Religious Center	Y	Safety and Security
United Church of Christ Congregational	570 Klem Road	Webster (T)	Religious Center	Y	Safety and Security
Henrietta United Church of Christ	1400 Lehigh Station Road	Henrietta (T)	Religious Center	Y	Safety and Security
Adams Basin United Methodist Church	4296 Canal Road	Ogden (T)	Religious Center	Y	Safety and Security
Hilton United Methodist Church	21 West Ave	Hilton (V)	Religious Center	Y	Safety and Security
East Rochester United Methodist Church	357 Fairport Road	East Rochester (T/V)	Religious Center	Y	Safety and Security
Rush United Methodist Church IL	6200 Rush Lima Road	Rush (T)	Religious Center	Y	Safety and Security
South Perinton United Methodist Church	291 Wilkinson Road	Perinton (T)	Religious Center	Y	Safety and Security
United Mthodist Church od Webster	169 E Main St	Webster (V)	Religious Center	Y	Safety and Security
Vineyard Christian Fellowship	2150 Portland Ave	Irondequoit (T)	Religious Center	Y	Safety and Security
Christ Chapel Wesleyan Church	1410 Lake Road West Fork	Hamlin (T)	Religious Center	Y	Safety and Security
Penfield Wesleyan Church	1580 Five Mile Line Road	Penfield (T)	Religious Center	Y	Safety and Security
Wesleyan Church Spencerport	2653 Nichols Street	Ogden (T)	Religious Center	Y	Safety and Security
Korean Bethel Presbyterian Church	121 Hemingway Dr	Brighton (T)	Religious Center	Y	Safety and Security





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Maranatha Christian Fellowship	259 Alexander St	Rochester (C)	Religious Center	Y	Safety and Security
Living Waters Christian Fellowship	85 Beaver Road	Chili (T)	Religious Center	Y	Safety and Security

Source: Monroe County GIS 2022

Senior Facilities

The following table summarizes the number of senior facilities, by type, for each jurisdiction in Monroe County.

Table F-20. Senior Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Webster Community Center	985 Ebner Road	Webster (T)	Senior	Y	Health and Medical
West Ridge Community Center	300 Chesterton Road	Greece (T)	Senior	Y	Health and Medical
Hilton Community & Senior Center	59 Henry St	Hilton (V)	Senior	Y	Health and Medical
Irondequoit Community Center	154 Pinegrove Ave	Irondequoit (T)	Senior	Y	Health and Medical
Julian Community Center	86 Vienna St	Rochester (C)	Senior	Y	Health and Medical
Senior Center at MCH	167 Westfall Road	Rochester (C)	Senior	Y	Health and Medical
Eastside Community Center	145 Parsells Rd	Rochester (C)	Senior	Y	Health and Medical
Brighton Comm & Senior Center	1666 Winton Road S	Brighton (T)	Senior	Y	Health and Medical
East Rochester Community Cntr	317 Main St	East Rochester (T/V)	Senior	Y	Health and Medical
Gates Senior Center	1605 Buffalo Road	Gates (T)	Senior	Y	Health and Medical
Mendon Community Center	167 N Main Street	Honeoye Falls (V)	Senior	Y	Health and Medical





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Ogden Community Center	269 Ogden Center Road	Ogden (T)	Senior	Y	Health and Medical
Penfield Community Center	1985 Baird Road	Penfield (T)	Senior	Y	Health and Medical
Perinton Community & Snr Cntr	1350 Turk Hill Road	Perinton (T)	Senior	Y	Health and Medical
Piittsford Comm & Snr Cntr	35 Lincoln Avenue	Pittsford (V)	Senior	Y	Health and Medical
Sweden Community Center	4927 Lake Road	Sweden (T)	Senior	Y	Health and Medical
Hamlin Town Hall	1658 Lake Road	Hamlin (T)	Senior	Y	Health and Medical
Fire Dept & Senior Center	1971 Rush Mendon Rd	Rush (T)	Senior	Y	Health and Medical
Crossman Community Center	42 East Ave	Fairport (V)	Senior	Y	Health and Medical
Greece Senior and Community Center	3 Vince Tofany Blvd	Greece (T)	Senior	Y	Health and Medical
Centro De Oro Senior Center	777 Clifford Avenue	Rochester (C)	Senior	Y	Health and Medical
Community Place Of Greater Rochest	145 Parsells Avenue	Rochester (C)	Senior	Y	Health and Medical
Henrietta Senior Center	515 Calkins Road	Henrietta (T)	Senior	Y	Health and Medical
Lifespan Downtown	25 Franklin Street	Rochester (C)	Senior	Y	Health and Medical
Marc Of Baden St	86 Vienna Street	Rochester (C)	Senior	Y	Health and Medical
Northwest Rochester Senior Center	71 Parkway	Rochester (C)	Senior	Y	Health and Medical
Ogden Senior Center	200 South Union Stre	Spencerport (V)	Senior	Y	Health and Medical
Riga Senior Center	6444 Buffalo Road	Riga (T)	Senior	Y	Health and Medical
Jean Daniel Senior Center	317 Main St	East Rochester (T/V)	Senior	Y	Health and Medical
Southwest Senior Center	540 Clarissa Street	Rochester (C)	Senior	Y	Health and Medical
Sweden Senior Center	133 State Street	Brockport (V)	Senior	Y	Health and Medical





				FEMA Designated	FEMA Lifeline
Facility Name	Address	Location	Critical Facility Type	Lifeline?	Category
Wheatland Senior	22 Main St	Scottsville (V)	Senior	Y	Health and Medical
Center					
Young-At-Heart Senior	3000 Dewey Avenue	Greece (T)	Senior	Y	Health and Medical
Center					
West Side Manor	1404 Long Pond Road	Greece (T)	Senior	Y	Health and Medical
Just Friends Senior	800 Carter Rd	Rochester (C)	Senior	Y	Health and Medical
Center					
Perinton Retirement	55 Ayrault Road	Perinton (T)	Senior	Y	Health and Medical
Home					

Source: Monroe County GIS 2022

Water Facilities

The following table summarizes the number of water facilities, by type, for each jurisdiction in Monroe County.

Table F-21. Water Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Webster WTP	593 Basket Road	Webster (T)	Potable Water Facility	Y	Food, Water, Shelter
Denise Reservoir	117 West Bloomfield Rd.	Pittsford (T)	Potable Water Facility	Y	Food, Water, Shelter
Parrish Reservoir	475 Parrish Rd	Mendon (T)	Potable Water Facility	Y	Food, Water, Shelter
City Of Rochester Water System	10 Felix Street	Rochester (C)	Potable Water Facility	Y	Food, Water, Shelter
Allens Creek Pumping Station	103 Allens Creek Road	Brighton (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Ayrault Pumping Station	323 Ayrault Road	Perinton (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Beahan Pumping Station	688 Beahan Rd	Chili (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Buffalo Pumping Station	4480 Buffalo Rd	Chili (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Crosstown BPS	see Mt. Read BPS	Greece (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Denise Pumping Station	117 West Bloomfield Rd	Pittsford (T)	Potable Water Pump Station	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
East Henrietta Pumping Station	4580 East Henrietta Rd.	Henrietta (T)	Potable Water Pump Station	Y	Food, Water, Shelter
East Main Pumping Station	1181 East Main St.	Rochester (C)	Potable Water Pump Station	Y	Food, Water, Shelter
Echo Pumping Station	216 Echo St.	Irondequoit (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Five Mile Pumping Station	1413 Five Mile Line Rd	Penfield (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Harek Pumping Station	1 Harek Rd.	Gates (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Harris Pumping Station	1503 Allen Rd.	Penfield (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Industrial Pumping Station	124 Industrial St.	Rochester (C)	Potable Water Pump Station	Y	Food, Water, Shelter
Kreag Pumping Station	125 Kreag Rd.	Perinton (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Lake Road Pumping Station	5105 Lake Road	Sweden (T)	Potable Water Pump Station	Y	Food, Water, Shelter
LaSalle Parkway Pumping Station	130 LaSalle Parkway	Perinton (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Lee Pumping Station	795 Lee Rd.	Greece (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Manitou Pumping Station	2221 Manitou Rd.	Ogden (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Mendon Pumping Station	320 Quaker Meeting House Rd.	Mendon (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Morgan Pumping Station	4200 Union Street	Chili (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Moseley Pumping Station	980 Moseley Rd.	Perinton (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Mt.Read Pumping Station	2835 Mt. Read Blvd.	Greece (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Ramona Pumping Station	2 Ramona Park Blvd.	Rochester (C)	Potable Water Pump Station	Y	Food, Water, Shelter
Riga Pumping Station	281 Riga-Mumford Rd.	Riga (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Scottsville Pumping Station	49 Chili-Wheatland Rd.	Chili (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Scribner Pumping Station	1507 Scribner Rd.	Penfield (T)	Potable Water Pump Station	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Twin Hills Pumping Station	5711 Ridge Road West	Parma (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Woodcliff Pumping Station	1340 Moseley Rd.	Perinton (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Low Lift Pumping Stations	639 Edgemere Drive	Greece (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Pump Station	70 Meadow Drive	Ogden (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Sewer Pump Station	3599 Big Ridge Road	Ogden (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Sewer Pump Station	2445 Spencerport Road	Ogden (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Sewer Pump Station	Meadow/Airy Drive	Ogden (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Sewer Pump Station	Land Re Way	Ogden (T)	Potable Water Pump Station	Y	Food, Water, Shelter
Douglas Road Tank	East of Douglas Rd	Mendon (T)	Potable Water Tank	Y	Food, Water, Shelter
Moseley Road Tank	Off Colonial Circle	Perinton (T)	Potable Water Tank	Y	Food, Water, Shelter
West Brighton Tank	Mortimer Ave	Brighton (T)	Potable Water Tank	Y	Food, Water, Shelter
Alleyn's Rise Tank	18 Alleyn's Rise	Perinton (T)	Potable Water Tank	Y	Food, Water, Shelter
Betteridge Road Tank	407 Betteridge Rd	Riga (T)	Potable Water Tank	Y	Food, Water, Shelter
Brockport Tank	5000 Lake Rd	Sweden (T)	Potable Water Tank	Y	Food, Water, Shelter
Canfield Road Tank	30 Canfield Rd	Pittsford (T)	Potable Water Tank	Y	Food, Water, Shelter
Chestnut Ridge Tank	261 Chestnut Ridge	Chili (T)	Potable Water Tank	Y	Food, Water, Shelter
Churchville Tank	11 Tower Lane	Churchville (V)	Potable Water Tank	Y	Food, Water, Shelter
Cobbs Hill #1 & #2 Tanks	475 Norris Dr	Rochester (C)	Potable Water Tank	Y	Food, Water, Shelter
Elmgrove Road Tank	2 Harek Rd	Gates (T)	Potable Water Tank	Y	Food, Water, Shelter
Garbutt Tank	9594 Union Street	Wheatland (T)	Potable Water Tank	Y	Food, Water, Shelter
Gloria Drive Tank	2705 Penfield Rd	Penfield (T)	Potable Water Tank	Y	Food, Water, Shelter
Harek Road Tank	1 Harek Rd	Gates (T)	Potable Water Tank	Y	Food, Water, Shelter
Harris Hill Tank	2126 Penfield Rd	Penfield (T)	Potable Water Tank	Y	Food, Water, Shelter
Hilton Tank	7 Cedar Terrace	Hilton (V)	Potable Water Tank	Y	Food, Water, Shelter
Keith Terrace Tank	44 Keith Terrace	Chili (T)	Potable Water Tank	Y	Food, Water, Shelter
Lee Rd #1 & #2 Tanks (plus # 3 site)	795 Lee Rd	Greece (T)	Potable Water Tank	Y	Food, Water, Shelter
Loud Road Tank	149 Loud Rd	Perinton (T)	Potable Water Tank	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Middle Road Tank	1391 Middle Rd	Henrietta (T)	Potable Water Tank	Y	Food, Water, Shelter
Mumford Tank	2444 Scottsvile Rd	Wheatland (T)	Potable Water Tank	Y	Food, Water, Shelter
Ogden Spheroid Tank	26 Ogden Center Road	Ogden (T)	Potable Water Tank	Y	Food, Water, Shelter
Riga Tank	281 Riga-Mumford Rd.	Riga (T)	Potable Water Tank	Y	Food, Water, Shelter
South Street Tank	1073 Webster Road	Webster (V)	Potable Water Tank	Y	Food, Water, Shelter
Spencerport Tank	3025 Brockport Road	Spencerport (V)	Potable Water Tank	Y	Food, Water, Shelter
State Road Tank	1659 State Road	Webster (T)	Potable Water Tank	Y	Food, Water, Shelter
Thayer Road Tank	795 Thayer Rd	Perinton (T)	Potable Water Tank	Y	Food, Water, Shelter
Union St Tank	4304 Union St	Chili (T)	Potable Water Tank	Y	Food, Water, Shelter
West Webster Tank	829 De Witt Road	Webster (T)	Potable Water Tank	Y	Food, Water, Shelter
Widger Road Tank	153 Widger Road	Ogden (T)	Potable Water Tank	Y	Food, Water, Shelter
Willard Road Tank	27 Willard Rd	Pittsford (T)	Potable Water Tank	Y	Food, Water, Shelter
Shoremont Treatment Plant Source: Monroe County GIS 2022	4799 Dewey Ave	Greece (T)	Potable Water Treatment	Y	Food, Water, Shelter

Wastewater Facilities

The following table summarizes the number of wastewater facilities, by type, for each jurisdiction in Monroe County.

Table F-22. Wastewater Facilities in Monroe County

Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
PS-1	965 Edgemere Dr @ Island Cottage (east *	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-2	1458 Crescent Beach Road (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-3	46 Braddock's Road (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-4	33 Cranberry Road (at Edgemere Drive) (*	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-5	2882 Edgemere Dr	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-6	2584 Edgemere Dr @ Lowden Point (NE cor*	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
PS-7	2376 Edgemere Dr (west of Wake Dr on ma*	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-8	25 Long Pond Rd	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-9	187 Long Pond Rd (behind Grove House, s*	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-10	521 North Drive (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-11	107 Shoreway Drive	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-12	566 Edgemere Dr (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-13	1150 Beach Ave (at Mann Road)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-14	4950 Dewey Ave	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-15	645 Ling Rd (across from) (Calm Lake Ap*	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-16	Ling Rd (west of the railroad crossing *	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-17	493 Pebbleview Drive	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-18	4 Dohrcrest Drive (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-19	1120 Latta Rd (Badgerow south, east of *	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-20	500 Maiden Lane	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-22	76 Golfshire Drive (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-23	284 Crossgates Road (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-24	184 Old Well Road	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-25	400 Island Cottage Road (in front of Po*	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-26	76 Renassance Drive (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-28	208 North Ave (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-29	830 Beach Ave (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-30	366 Lakeshore Dr (across from)	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-31	East Manitou Road Braddocks Bay	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
PS-33	491 Janes Rd, on Kirk Rd side	Greece (T)	Sanitary Pump Station	Y	Food, Water, Shelter
Webster Lake Station (Low Lift)	1720 Lake Road	Webster (T)	Wastewater Lift Station	Y	Food, Water, Shelter
(Low Lift)	n Plan - Monroe County, New York	webster (1)	A-102	Y	rood, water,

Hazard Mitigation Plan - Monroe County, New York 2023 Ŧŧ



Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Kodak Water Pumping Station	Edgemere Dr	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter
MCWA Edgemere Pumping Station	639 Edgemere Dr	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Scottsville Pump Station	4260 W River Road	Wheatland (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Beaver Road Pump Station	94 OLD SCOTTSVILLE CHILI ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Brighton 5 Pump Station	289 E RIVER ROAD	Brighton (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Buttonwood Pump Station	15 N GREECE ROAD	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Charlotte Pump Station	530 RIVER ST	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Cliff Street Screenhouse	238 LAKE AVE	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Clinton & Keeler Pump Station	1		Wastewater Pump Station	Y	Food, Water, Shelter
Dearcop Pump Station	DEARCOP DR	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Flynn Road Pump Station	635 FLYNN ROAD	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Forestview Pump Station	SNOWBERRY CRES	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
GCO Pump Station	145 PAUL ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Genesee Street Pump Station	115 ELMWOOD AVE	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Glenwood Screenhouse	20 GLENWOOD AVE	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Glycol Pump Station	1135 BROOKS AVE	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Howard Road Pump Station	875 HOWARD ROAD	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Irondequoit Bay Pump Station	PINEGROVE AVE	Irondequoit (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Island Cottage E-One Greece Pump Station	400 ISLAND COTTAGE ROAD	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Island Cottage Pump Station	402 ISLAND COTTAGE ROAD	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
John Street Pump Station	375 JOHN ST	Henrietta (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Pinnacle Road Pump Station	290 PINNACLE ROAD	Henrietta (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Renaissance Pump Station	28 DA VINCI DR	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Riverdale 1 Pump Station	2075 SCOTTSVILLE ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Riverdale 2 Pump Station	1889 SCOTTSVILLE ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Riverdale 3 Pump Station	29 CHARLES AVE	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Riverdale 4 Pump Station	40 NAMES ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Riverdale 5 Pump Station	150 BALLANTYNE ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Riverdale 6 Pump Station	1 LESTER ST	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Rocky Coast Pump Station	2222 ST PAUL ST	Irondequoit (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Southwest Pump Station	90 OLD SCOTTSVILLE CHILI ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Sunset Pump Station	26 SUNSET HILL	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Tarwood Pump Station	105 KENCREST DR	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Union Station Pump Station	3 UNION STATION ROAD	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
West Henrietta Pump Station	2611 W HENRIETTA ROAD	Brighton (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Central Gates Sanitary Pump Station	1150 BUFFALO ROAD	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Central Gates Storm Pump Station	1150 BUFFALO ROAD	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Lake & Merrill Pump Station	1991 LAKE AVE	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter





Facility Name	Facility Name Address		Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Lee Road Pump Station	1100 LEE ROAD	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Maplewood Pump Station	450 MAPLEWOOD DR	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
McEwen Drive Pump Station	436 MC EWEN DR	Webster (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Mill Seat Pump Station	303 BREW ROAD	Riga (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Seabury Woods Pump Station	110 DALAKER DRIVE	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Thomas Creek Pump Station	98 COBBS LANE	Perinton (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Trolley Boulevard Pump Station	950 TROLLEY BOULEVARD	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
West Chili Pump Station	3454 UNION St	Chili (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Zoo Pump Station	2222 ST PAUL ST	Irondequoit (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Churchville Pump Station	15 CARROLL ST	Churchville (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Spencerport Pump Station	20 NORTHRUP CREEK DR	Spencerport (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Timpat Pump Station	109 TIMPAT DRIVE	Gates (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Fairbanks Pump Station	5670 BUFFALO RD	Riga (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Kodak Pump Station	TECHNOLOGY BLVD	Greece (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Western Gateway Pump Station	1695-1715 EMERSON ST	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Runway Pump Station	1200 BROOKS AVE	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Sand Bar Pump Station	285 LAKE RD	Webster (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Pattonwood Pump Station	160 PATTONWOOD DRIVE	Irondequoit (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Elmwood Pump Station	1165 ELMWOOD AVENUE	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Riverton Pump Station	465 SCOTTSVILLE W HENRIETTA ROAD	Henrietta (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Industry Pump Station	375 RUSH SCOTTSVILLE ROAD	Rush (T)	Wastewater Pump Station	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Pittsford Pump Station		Henrietta (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Wheatland NE Sewer District Pump Station	3818 Scottsville Rd	Wheatland (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Summerville Pump Station		Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Airport Pump Station	1135 Brooks Ave	Rochester (C)	Wastewater Pump Station	Y	Food, Water, Shelter
Ashwood Lane Sewer Pump Station	1 Ashwood Lane	Webster (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Woodstone Sewer Pump Station	63 Woodstone Circle	Webster (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Seasons Trail Sewer Pump Station	188 Seasons Trail	Webster (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Ridgefield Dr Lift Station	22 Ridgefield Dr	Churchville (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Chiswick Dr Liftstation	55 Chiswick Dr	Churchville (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Royce Dr Liftstation	18 Royce Dr	Churchville (V)	Wastewater Pump Station	Y	Food, Water, Shelter
N Main St Liftstation	101 N Main St	Riga (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Ridgefield Dr Liftstation	22 Ridgefield Dr Village of Churchville*	Churchville (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Chiswick Dr Liftstation	55 Chiswick Dr Village of Churchville M*	Churchville (V)	Wastewater Pump Station	Y	Food, Water, Shelter
Royce Dr Liftstation	18 Royce Dr Village of Churchville Monr*	Churchville (V)	Wastewater Pump Station	Y	Food, Water, Shelter
North Main St Liftstation	101 N Main St Village of Churchville Mo*	Riga (T)	Wastewater Pump Station	Y	Food, Water, Shelter
Frank E. Van Lare Treatment Facility	1574 Lakeshore Blvd	Rochester (C)	Wastewater Treatment Facility	Y	Food, Water, Shelter
Northwest Quadrant Treatment Facility	Payne Beach Road	Greece (T)	Wastewater Treatment Facility	Y	Food, Water, Shelter
Honeoye Falls Wastewater Treatment Plant	100 Ulrich Lane	Honeoye Falls (V)	Wastewater Treatment Facility	Y	Food, Water, Shelter
Spencerport Wastewater Treatment Plant	6 Big Ridge Road	Spencerport (V)	Wastewater Treatment Facility	Y	Food, Water, Shelter





Facility Name	Address	Location	Critical Facility Type	FEMA Designated Lifeline?	FEMA Lifeline Category
Village of Webster	613 Webster Road	Webster (T)	Wastewater Treatment	Y	Food, Water, Shelter
			Facility		
Webster Central	-	Webster (T)	Wastewater Treatment	Y	Food, Water, Shelter
			Facility		

Source: Monroe County GIS 2022





APPENDIX H. RISK ASSESSMENT SUPPLEMENTARY DATA

This appendix contains information and details to support information provided in Section 5 (Risk Assessment).

H.1 HISTORY OF HAZARD EVENTS WITHIN THE COUNTY

To supplement the information provided in this plan, events prior to the update of this plan are included below by hazard of concern type. Many sources provided historical information regarding previous occurrences and losses associated with hazards throughout New York and Monroe County. It is noted that, with a number of sources reviewed for the purpose of this HMP, loss and impact information for many events could vary depending on the sources.

For more information on past events and impacts, refer to the 2017 Monroe County Hazard Mitigation Plan.

H.1.1 Earthquake

Known earthquakes events that have impacted New York State and Monroe County between 1857 and 2015 are identified in Table H.1. Many sources were researched for historical information regarding earthquake events in Monroe County; therefore, Table H.1 may not include all earthquake events that have impacted the County.





Table H.1. Earthquake History in Monroe County, 1857-2015

Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
October 23, 1857	"VI" on the Modified Mercalli Scale	Darien, Genesee County, New York	N/A	No	An earthquake in Darien, Genesee County, was measured as a "VI" on the Modified Mercalli Scale (HAZNY, 1999).
August 12, 1929	Magnitude 5.2	Attica, Wyoming County, New York	N/A	No	A magnitude-5.2 earthquake occurred in Attica, Wyoming County, new York (HAZNY, 1999).
1935	Magnitude 6.1	Along the Northern New York-Western Quebec Seismic Zone	N/A	No	A magnitude-6.1 earthquake occurred along the Northern New York- Western Quebec Seismic Zone (Democrat & Chronicle, 6.24.10).
1944	Magnitude 5.8	Massena, St. Lawrence County, New York	N/A	No	A magnitude-5.8 earthquake centered near Massena, St. Lawrence County was recorded as New York's largest earthquake to date. Its epicenter was near Massena, St. Lawrence County. Shaking was felt from Canada to Maryland and from Indiana to Maine. \$2 million in damage was reported in Massena and in Cornwall, Canada (Democrat & Chronicle, 11.3.05).
January 1, 1966	Magnitude 4.7	Attica, Wyoming County, New York	N/A	No	A magnitude-4.7 earthquake in Attica, Wyoming County, New York, damaged the smokestack at the Attica Correctional Facility (Democrat & Chronicle, 11.3.05).
June 13, 1967	Magnitude 4.4	Attica, Wyoming County, New York	N/A	No	A magnitude-4.4 earthquake was recorded in Attica, Wyoming County.
October 7, 1983	Magnitude 5.2	Adirondacks, Blue		No	A magnitude-5.2 earthquake in the Adirondacks, New York, Blue Mountain Lake area prompted RG&E to declare an "Unusual Event" Classification at Ginna Station (Peter Polfleit letter, 8-11-03). At the time, this was the third-largest earthquake ever recorded in the State of New York (Democrat & Chronicle, 9-26-98, 6.24.10) (Democrat & Chronicle, 6.24.10).
November 25, 1988	Magnitude 6.0	95 miles west of Quebec City, Canada	N/A	No	The epicenter of this earthquake was 95 miles west of Quebec City, in Canada. Measure was 6.0 on the Richter Scale (County Office of Emergency Management file).
October, 1990	Magnitude 4.7	120 miles northwest of Montreal, Canada	N/A	No	A magnitude-4.7 earthquake centered 120 miles northwest of Montreal, Canada, occurred. (Democrat & Chronicle, 9-26-98).
June, 1991	Magnitude 3.9	Schoharie County, New York	N/A	No	A magnitude-3.9 earthquake centered in Schoharie County, 40 miles west of Albany, New York, was felt by residents in the Monroe County towns of Irondequoit and Greece (Democrat & Chronicle, 6.24.10).
September 25, 1998	Magnitude 5.2	15 miles north of Sharon, Pennsylvania	N/A	No	A magnitude-5.2 earthquake whose epicenter was 15 miles north of Sharon, Pennsylvania, resulted in damage at two Monroe County residences, one with ceiling damage and one with front porch damage. (Gene Lenhardt, U.S. Army Corps of Engineers, telephone interview, 1-6- 99)(County Office of Emergency Management Response File).





Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
January 1, 2000	Magnitude 4.5	North Bay, Ontario, Canada	N/A	No	A magnitude-4.5 whose epicenter was North Bay, Ontario, Canada, produced tremors felt in the Rochester area (Democrat & Chronicle, 4-2- 02).
April 20, 2002	Magnitude 5.1	Town of Black Brook, Clinton County, New York	N/A	No	An earthquake with its epicenter roughly 15 miles southwest of Plattsburgh in the Town of Black Brook, Clinton County, New York, measured 5.1 on the Richter Scale and produced shaking which lasted about 30 seconds. Two aftershocks were reported. More than 300 people called Monroe County's 911 Center within 30 minutes of the quake. No reported injuries or damage in the County, although the State EOC was activated (Democrat & Chronicle, 4-21-02). (SEMO, "Emergency Management Times," Spring 2002, p.1).
October 31, 2005	Magnitude 2.6	Wayne County, New York	N/A	No	Two earthquakes occurred in Wayne County, New York, rattling the area over the course of 3 hours. USGS confirmed that the first of the 'micro- earthquakes,' which was felt about 7:00 p.m., had a magnitude of 2.6 and was centered in the Town of Ontario. The second was weaker, and struck at 11:38 p.m. under Lake Ontario, 15 miles northwest of the Town of Sodus (Wayne County). The second quake had a magnitude of 1.5, according to the USGS. The quakes did not produce enough disturbance to show on the Ginna Nuclear Power Plant's seismic register. (Democrat & Chronicle, 12.24.05).
March 8, 2008	Magnitude 2.7	10 miles north-northeast of Lancaster, New York	N/A	No	An earthquake with a depth of 6 kilometers had its epicenter 10 miles north-northeast of Lancaster, New York (Erie County) and a magnitude of 2.7. The USGS website indicated that there were 25 reports from people having felt this event, with a majority of reports located in the Buffalo, New York area (Erie County) (NWS, Judy Levan, e-mail, 3.19.08).
June 5, 2009	Magnitude 2.9	Attica, Wyoming County, New York	N/A	No	A 2.9-magnitude earthquake centered in Attica, Wyoming County, occurred at 11:07 a.m. The epicenter was 3 miles SSE of Attica and 5 miles south of Alexander, Genesee County. No damage was reported. (Democrat & Chronicle, 6.6.09).
Jun. 23, 2010	Magnitude-5.0	Centered north of Ottawa, Canada	N/A	No	 A magnitude-5.0 earthquake struck at the Ontario-Quebec border region of Canada, shaking homes and businesses from Toronto to the states of New York, Michigan, and Vermont, according to the U.S. Geological Survey. The earthquake was centered at a depth of about 12 miles. Monroe County's 911 center had more than 80 calls about the earthquake just minutes after it occurred. The tremor was felt at numerous buildings in the City of Rochester, and some buildings were briefly evacuated.
May 17, 2013	Magnitude-4.4	13 miles northeast of Shawville, Quebec, Ontario, Canada	N/A	No	A 4.4-magnitude earthquake in Ontario, Canada, was felt starting at 9:43 a.m. May 17 from upstate New York to the Vermont border. People in communities along the St. Lawrence River and as far east as Lake Champlain on New York-Vermont border reported feeling their homes shake.





Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
					In Monroe County, the Rochester City 911 dispatch center received a small handful of calls in the half-hour after the earthquake. No injuries or damage to critical infrastructure were reported.

Source(s):	FEMA 2014; IRIS 2015; USA Today 2013; Democrat and Chronicle 2010
004100(0)1	TEMILEOI I, MID 2010, Obil Today 2010, Democrat ana om omere 2010

- Note: All magnitudes referenced refer to the Richter Scale, unless otherwise specified.
- DR Disaster Declaration ЕОС Emergency Operations Center
- FEMA Federal Emergency Management Agency
- Hazards New York HAZNY
- Not Applicable
- N/A
- NWS National Weather Service
- SEMO State Emergency Management Office
- USGS United States Geological Survey





H.1.2 Extreme Temperature

Information regarding specific details of temperature extremes in Monroe County is scarce; therefore, previous occurrences and losses associated with extreme temperature events are limited. Table H.2 summarizes the extreme temperature events in the County from 2005 through 2015.





Table H.2. Extreme Temperature Events between 2005 and 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
January 21 – 27, 2005	Extreme low temperatures	N/A	N/A	Record low temperatures were set on the 21st (-10 degrees) and 22nd (-nine degrees), with below normal low's on the 23rd, 24th, 26th, 27th and 28th. There was an extended cold period from January 17 to February 2, with temperatures at zero or below on eight of these overnights.
July 12 – 13, 2005	Extreme Heat	N/A	N/A	This extreme heat event caused power outages throughout the county. The extended periods of heat and humidity, combined with an increase in air conditioning loads, put a significant stress on the power system. RG&E reported outages on July 12, which was caused by equipment malfunctions, some of which could have been heat related.
Summer 2005	Extreme Heat	N/A	N/A	The summer of 2005 was the warmest summer since 1973, and the fifth-warmest summer on record. The City of Rochester saw 13 days with temperatures in the 90s, with a high of 94 degrees on August 4). The summer also set five records for power use. The peak came July 18, when 1,626 megawatts of power were used. The summer recorded the fifth warmest June, the 20th-warmest July, and the 10th-warmest August in Rochester's history.
July 14 – 18, 2006	Extreme Heat	N/A	N/A	Temperatures began in the mid-to-high 80s with a corresponding heat index in the high 80s. Rochester General Hospital treated six patients with heat-related illnesses between the 15th and the 17th. RG&E customers set a 1-day usage record of an estimated 1,630 megawatts. The NWS reported that July 2006 was the hottest July in the City of Rochester since 1955.
August 1-2, 2006	Extreme Heat	N/A	N/A	 The National Weather Service, Buffalo Office issued an "Excessive Heat Warning" beginning August 1 at noon until August 2 in anticipation of high humidity combining with hot temperatures to make it feel like 105 degrees or greater (NWS Urgent- Weather Message, August 1, 2006, 0351 hours). Temperatures and their corresponding heat index were 94 degrees, 106 heat index on August 1 and 98 degrees 105 heat index on August 2. Power status as reported by RG&E: August 1: Outage for 1,500 customers; power consumption set new record at 1,744 megawatts August 2: Outage for 1,500 customers (These were new outages - the previous day's outages had already been restored.) Activity influenced by this extreme temperature condition included: County Health Department and Red Cross opening and staffing four cooling centers within the county County Health Department opening and staffing a "Special Needs Cooling Center" for mobility impaired City enforced the "Cool Sweep" (fire hydrants) program and extended swimming pool hours Homeless Shelters adjusted hours of operation for access during the daytime hours





OF NEW X		FEMA		
		FENIA Declaration	County	
Dates of Event	Event Type	Number	Designated?	Losses / Impacts
				 Cancellations included" school district summer schools, community special events, summer day camps, Buffalo Bills Summer Camp Training Schedule; Finger Lakes Race Track (horse races) Operations adjusted for DPW projects and construction workers, fire fighters Sidewalk vendors altered and/or cancelled their lunch wagon services The Governor waived fees for NYS Parks and NYSDEC sites on August 2 Hospitals reported about a dozen heat-related Emergency Room visits The Humane Society treated one dog suffering heatstroke
January 26 – 30, 2007	Extreme low temperatures	N/A	N/A	Cold temperatures on the 26th prompted school closings, were blamed for traffic accidents as it was too cold for road salt to be effective, and prompted homeless shelters to extend hours of operation. Temperatures during this period were in the single digits.
February 3 -7, 2007	Extreme low temperatures	N/A	N/A	 January 28 began the longest stretch (22 days) of below-freezing temperatures in more than 25 years, and February was the coldest recorded in 14 years. This cold came from the same storm that affected a wide swath of the northern United Sates from the north Plains through the Great Lakes, with temperatures as low as minus 42 degrees. At least four cold-related deaths were recorded. Across this period from February 3 to 7, temperatures ranged from lows of 3 to 10 degrees below zero, with steady winds of 20-plus mph and gusts in the 40 mph range. The National Weather Service, Buffalo Office, issued a Wind Chill Advisory beginning on the 5th and ending the morning of the 6th. The following disruptions to community routine were reported during the weekdays (February 5 to 7): Many schools closed Spencerport School District buses became stranded when their diesel fuel jelled, clogging fuel filters. No injuries, just significant transportation delays. 700 AAA calls for service (double the norm) for dead batteries, stranded vehicles, and other cold weather-related problems. Requests from the Open Door Mission in the City of Rochester for donations of warm clothing for the homeless Traffic problems that were a result of ineffective snow melting Amtrak passenger trains cancelled on the 4th and 5th, resumed with delays on the 6th.
January 2009	Extreme low temperatures	N/A	N/A	The January temperature averaged more than 5 five degrees colder than normal, with 18 of the first 23 days recorded below freezing, breaking the previous 30-year record of 16.4 of 30 days in January. USDA crop losses reported in Monroe County for 2009 related to frost totaled \$6,848.
July 5-8, 2010	Extreme Heat	N/A	N/A	 Four days of 90-degree temperatures and higher in the City of Rochester prompted the following: Rochester City "Cool Sweep" program opened fire hydrants and extended swimming pool and beach hours







OF NEW				
Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				 Operations adjustments for Department of Public Works (DPW) projects and construction workers, fire fighters Air Quality Advisory or Alert issued on July 4, 5, and 7. The Humane Society issued reminders about pet safety in extreme heat conditions. County Executive extended hours of operation for swimming at Ontario Beach Park County Health Department planning for potential need to open a Special Needs Shelter at Monroe Community Hospital and issued a reminder of heat-related health symptoms and safety tips for high temperatures (Monroe County News Release, July 6, 2010) Rochester Gas and Electric (RG&E) partnered with the Red Cross to distribute 250 electric fans at no charge to seniors and individuals or families receiving Social Security Income (SSI) or Social Security Disability (SSD) assistance. USDA crop losses reported in Monroe County for 2010 related to heat totaled \$343,634, with the greatest losses affecting the sweet corn crop.
January 22, 2011	Freeze and Extreme Cold	N/A	N/A	Monroe County experienced losses caused by a freeze and extreme cold event that occurred January 22, 2011. Conditions caused hundreds of farmers to suffer significant production losses around the region. USDA crop losses reported in Monroe County for 2011 related to frost totaled \$34,104 in apple crops.
March – April, 2012	Frosts, Freezes	N/A	N/A	After a winter of record high temperatures, many crops in New York blossomed earlier than usual and were destroyed when exposed to early spring freezing temperatures occurring between March 1 and April 30. In March 2012, the county was designated a contiguous county in USDA Disaster (S3250) which resulted from frosts, freezes, unseasonable warm temperatures, and excessive heat, and was later designated as a primary county in Disaster S3249 resulting from frosts and freezes. USDA crop losses reported in Monroe County for 2012 related to freeze and frost totaled \$984,583.
June 2012	Drought / Excessive Heat	N/A	N/A	 Temperatures averaged above normal in June for the Great Lakes climate division of New York State, where it was the 18th warmest June since 1895. At the same time, the climate division posted below normal rainfall for the fourth out of the 5 previous months. This event resulted in a USDA Disaster Declaration (S3427), and Monroe County was included as a contiguous county in this declaration. The county was considered to be abnormally dry for this time of year. USDA crop losses reported in Monroe County for 2012 related to excessive heat totaled \$79,286.
December 2013 – March 2014	Frost / Freeze	N/A	N/A	The winter of 2013-2014 was one of the coldest in recent history for New York State. Temperatures finished below normal every month for the Rochester climate station, with the average temperature between November and April being 30.3°F, which was 3.4°F below normal. The January through March timeframe finished more than 4 degrees below normal. The Rochester station recorded seven new daily low temperature records: November 13 and 24, December 17, January 3 (low max and low min records), and 7, and March 6.





APPENDIX H: SUPPLEMENTARY DATA

COF NEW /		FEMA Declaration	County	
Dates of Event	Event Type	Number	Designated?	Losses / Impacts
				The long winter of sub-zero temperatures led to deep winter freezes, severely damaging farms, orchards, and vineyards across upstate New York. A survey of damaged farms by Cornell University reported primary bud damage as high as 85 percent in the Finger Lakes region and 97 percent in Lake Erie region.
				This event resulted in a USDA Disaster Declaration (S3672), and Monroe County was included as a contiguous county in this declaration. USDA reported 2014 indemnity losses in Monroe County of more than \$160,000 to its apple crop caused by frosts and freezes. Another \$10,626 was paid to apple crops as a result of the freeze in 2013, which may have been a result of the 2013-2014 winter season.

Sources: NOAA-NCDC 2014; NWS 2014

Note (1): Monetary figures within this table were U.S. Dollar (USD) figures calculated during or within the approximate time of the event. If such an event would occur in the present day, monetary losses would be considerably higher in USDs as a result of increased U.S. Inflation Rates.

NOAA-NCDC National Oceanic Atmospheric Administration – National Climatic Data Center

NWS National Weather Service

NYS New York State





Known flooding events that occurred from 1972 to 2015 are identified in Table H.3. With flooding documentation for New York State and Monroe County being so extensive, not all sources have been identified or researched. Therefore, Table H.3 may not include all events that have occurred in the County.





Table H.3. Flooding Events in Monroe County Between 1972 and 2015

Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 23-26, 1972	Hurricane Agnes	DR-338	Yes	Tropical Storm Agnes and associated weather systems produced the most destructive widespread flooding of record over eastern United States. In the Genesee Basin, the predominant portion of rainfall occurred from 9 p.m. on 20 June, to 6 a.m. on 23 June. The maximum total storm rainfall, 13.72 inches, and maximum daily rainfall, 6.57 inches, were recorded at the Wellsville gage. A "bucket survey" of the Genesee Basin by USACE personnel indicated a maximum of about 16 inches of rainfall in the upper reaches of Dyke Creek near Andover, New York. Average total basin rainfall during the period 20-25 June was 7.1 inches, while the average for the same period on the upper basin (above Mount Morris dam) was 10.20 inches. Regulation during a portion of this flood required controlled release of dam outflows exceeding downstream channel capacity to prevent overtopping the spillway with debris-laden flows. The reservoir pool reached a maximum elevation of 755.8 feet, thus occupying approximately 96 percent of total reservoir storage. This was the highest pool elevation ever attained in the Mount Morris Reservoir. Detailed information on this flood appears in Buffalo District's "Report of Flood, Tropical Storm Agnes, 21-23 June 1972, Genesee River Basin," dated August 1973 (USACE "Genesee River Flood Emergency Exercise Manual, February 1992," p. H-4). Rochester received more than 4 inches of rain. Meanwhile, destructive floods washed out roadways and bridges, and even caused building damage on the upper Genesee River. It took nearly all summer to drain local fields (Democrat & Chronicle, June 22, 2006).
1972	Lake Ontario - High Levels	N/A	N/A	None recorded.





Date(s) of Event March 21, 1973	Event Type High Winds, Wave Action, Flooding	FEMA Declaration Number DR-367	County Designated? Yes	Losses / Impacts FEMA Disaster Declaration.
Spring 1973	Coastal (Lacustrine) Flooding	N/A	N/A	The most severe flooding along the Lake Ontario shoreline was during spring 1973. Lake Ontario's water levels rose to 249.6 feet above sea level as a result of excessive rain in 1972 throughout the Great Lakes Basin. This level of water rise was recorded as having an approximately 100-year recurrence interval. Damages resulting from the water rise and associated flooding included extensive property damage, public utility interruption, and destruction of roads. Flooding also contaminated local water supply and reduced the effectiveness of effluent disposal (FEMA FIS 2008).
October 29, 1974	Localized Flooding	N/A	N/A	A sewer tunnel being constructed under the Barge Canal in Bushnell's Basin cracked and gave way, sending over 200 million gallons of water down Tributary 21 and into Brook Hollow Rd. Because the flood was so localized, it was not designated a disaster area. 41 homes damaged, 2 demolished Power outages in 165 homes 100 homes without gas Displaced residents Roads destroyed Millions of dollars in property damage 1 minor injury





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
February and July 1976	Severe Storms, Heavy Rains, Flooding, and Thunderstorms	N/A	N/A	During the period 16-23 February, approximately 2.6 inches of rain fell over the upper basin. This rainfall, augmented by about 2 inches of snowmelt runoff, resulted in a peak reservoir elevation on 23 February of 727.6, or about 71 percent of available storage. During the remainder of February, every effort was made to discharge as much water as possible consistent with downstream conditions. At the end of the month, the pool elevation was 709, or about 56 percent of capacity. During the period 1-6 March, about 2.5 inches of rain, including some snowmelt, caused the pool to rise again.
				On 6 March, the reservoir pool peaked at 744.1 feet, thus utilizing 85% of total storage. Peak inflows to Mount Morris Reservoir during the February and March runoff events reached 32,500 cfs and 28,000 cfs, respectively. Although the peak inflows were not particularly impressive, the volume of water received caused the pool elevation to be the second highest of record, exceeded only by that of Tropical Storm Agnes (USACE, "Genesee River Flood Emergency Exercise Manual, February 1992," p. H-4).
March 28-30, 1993	Flood	N/A	N/A	Flooding on some creeks and rivers. "The most significant occurred along Black Creek in Monroe County. A dozen homes along the creek were surrounded by water. Large segments of roads were inundated and still closed at months end. The Genesee River rose just above floodstage at Avon and Rochester even with closure of all gates at the Mt. Morris Dam. The dam stored over 5 inches of runoff and used 85% of its storage capacity." The County EOC was activated on March 30th for 4 hours.
April 1-5, 1993	Flood	N/A	N/A	Flooding continued as a result of additional rain and snowmelt—the worst flooding since Hurricane Agnes in 1972. The County EOC was activated on April 1st for 39.5 hours. Additional information is available at County OEM: USACE, "After Action Report for the Flood of 1993"; NOAA's, "Natural Disaster Survey Report: The Great Flood of 1993," and the County's Disaster Response File.
April 1993	High Levels	N/A	N/A	Lake Ontario. County files available at the OEM.
March 23-24, 1994	Flood	N/A	N/A	Rainfall combined with snowmelt caused flooding. Black Creek at Churchville reached flood stage on the 23rd. Oatka Creek reached flood stage at Garbutt on the 24th.





OF NEW X				
Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
April 14, 1994	Flood	N/A	N/A	Spring rains, together with saturated ground, raised the level of the Genesee River about a foot and a half above flood stage. A few roads had minor flooding.
January 21, 1995	Flood	N/A	N/A	Heavy rains on the 20th caused Black Creek to exceed flood stage and overtop its banks at various locations along its reach.
August 3, 1995	Flash Flood	N/A	N/A	Flash flooding in Monroe County caused \$35,000.00 in damages.
January 19, 1996	Rising Waters	N/A	N/A	The County EOC was activated for 2 hours to assess and coordinate agency activity associated with rising waters due to a "January Thaw" and rainfall.
April 14-15, 1996	Flood	N/A	N/A	A general 1- to 2-inch rainfall, combined with lingering snowmelt from higher elevations, resulted in considerable lowland flooding. Most major creeks and rivers rose to bankful. The Genesee River was above flood stage for 5 hours. Oatka Creek was above flood stage for 31 hours. Black Creek was above flood stage for 8 hours and caused \$15,000.00 in damages.
June 12, 1996	Flash Flood	N/A	N/A	Thunderstorms moving across the southern portion of the county produced torrential rains and caused flash flooding on the west side. Several roads in Chili were flooded and had to be closed until sewers could handle the storm runoff. Estimated property damage was \$20,000.00.
July 30, 1996	Flash Flood	N/A	N/A	Thunderstorms during the late afternoon hours dropped over 2 inches of rain within 4 hours, resulting in flash floods. The waters flooded over 200 basements in the City of Rochester and caused an estimated \$45,000.00 in damages.
October 19-20, 1996	Flash Flood	N/A	N/A	Flash flooding occurred, causing an estimated \$100,000.00 in damages.
1997	High Levels	N/A	N/A	Lake Ontario. County response files available at the OEM.
February 5, 1997	Dam Failure/Flood	N/A	N/A	An earthen dam gave way, causing flood waters to spill onto roadways and several backyards. Damage was estimated at \$4,000.00.
1998	High Levels	N/A	N/A	Lake Ontario. County response files available at the OEM.





OF NEW				
Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
January 8 and 11, 1998	Flood	DR-1196	Yes	Western (and Central) NYS was drenched with unprecedented January rainfalls over a 36-hour period. Generally, 3 to 4 inches of rain fell on bare, saturated ground across the Genesee basin. The Genesee River crested at 36.4 feet at Avon (the highest since 1972) and at 16.8 feet in Rochester (the highest since 1984). Black Creek crested at Churchville at 9.2 feet (the highest since 1960). At Garbutt, Oatka Creek crested at 8.7 feet (a record flood). Damages were estimated at \$375,000.00. Local fire fighting and public works departments were called to pump water from flooded basements. The floodwaters overwhelmed several municipal wastewater treatments plants, and water emergencies were declared. Several States of Emergency were declared at various locations in Western/Central NYS. The Town of Webster had estimated damages of \$100,000.00 resulting from flash flooding. The County EOC was activated for 30 minutes on January 8th. This event prompted a Disaster Declaration by President Clinton, FEMA-1196-DR-NY.
June 13, 1998	Flood	N/A	N/A	Thunderstorms crossed the western Finger Lakes during the early evening hours, dropping several inches of rain in less than an hour. The heavy rains flooded roads and forcing closures throughout Monroe County. Chili Center had estimated damages of \$30,000.00.
June 25-July 10, 1998	Severe Storms and Flooding	DR-1233	Yes	FEMA Declared Disaster.
June 30, 1998	Flood	N/A	N/A	Thunderstorms throughout the day dropped several inches of rain over the same area. The heavy rains resulted in urban and drainage flooding in the Rochester metro area. The Town of Brighton had estimated damages of \$13,000.00.
July 8, 1998	Flood	N/A	N/A	Nearly 3 inches of rain fell at the Rochester airport, with slightly higher amounts reported over the southern suburbs. Urban flooding resulted in Rochester, Pittsford, and Penfield. In Penfield, basements of the Forest Hills Condominium complex flooded for the second time that year. Many of the basements and appliances had just been repaired and replaced following floods in January. The Town of Penfield had damages estimated at \$100,000.00, and the Town of Pittsford reportedly had \$150,000.00 in damages.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
August 25, 1998	Flood	N/A	N/A	Slow moving thunderstorms moved across the Rochester metro area producing 2 to 4 inches of rain in just a few hours. Widespread urban flooding occurred. The Sheriff reported numerous roads closed across the south and southeast areas of the County. Estimated damages were \$35,000.00.
January 23-24, 1999	Flood	N/A	N/A	Warm temperatures melted the snowpack from record snowfall in late December and early January. Nearly 2 feet of ripe snowpack dissolved to just a few inches. The runoff caused flooding in poor drainage and low lying regions across the area, with roads closed at some locations for a couple of days. One of the hardest hit areas in Monroe County was the Town of Chili, where evacuations occurred. Damages were estimated at approximately \$55,000.00.
May 12, 2000	Flash Flood	N/A	N/A	Thunderstorms rolled across the Niagara Peninsula and then along the Lake Ontario shore counties. Only small hail was reported with the storms; however, the storms produced hurricane-force winds. An 86 mph wind gust was recorded at the Niagara Coast Guard Station in Youngstown. The high winds buffeted the area, taking down trees and power lines. Various communities reported power outages of 12 hours or more. In Irondequoit, Monroe County, Kings Highway and Bayview Road caved in as a result of erosion.
May 13, 2000	Flash Flood	N/A	N/A	A second round of thunderstorms crossed the area during the early afternoon hours. The heavy rains that fell on already saturated ground resulted in flash flooding in Monroe and Wayne Counties. In Webster, for example, 4 to 6 inches of water covered Schlegel Road. Road closures were common in the area for several hours.
July 16, 2000	Flash Flood	N/A	N/A	Thunderstorms brought heavy rains to the area, dropping 2 to 3 inches of rain. West Henrietta and Jefferson, roads had to be closed due to the flood waters. In the City of Rochester, police closed Romona Street, Mt. Read Boulevard, and Lexington, Driving Park, and LaGrange Avenues. Damages were estimated at \$15,000.00.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
March 18, 2003	Flood	N/A	N/A	An abrupt change to warmer weather at mid-month resulted in a quick meltdown of the winter snowpack. Area creeks rose to near or above bankful, with three creeks in western NYS exceeding flood stage. A Churchville, Monroe County, the Black Creek crested at 6.7 feet or about half a foot above flood stage. Oatka Creek at Garbutt, Monroe County crested at 6.2 feet, just above its 6-foot flood stage. Tonawanda Creek overflowed its banks, with flooding along the Erie/Niagara county border The creek crested at 13.8 feet, almost 2 feet above the flood stage.
May 24, 2004	Flash Flood	N/A	N/A	A weak cold front crossed the area during the overnight hours. The slow moving thunderstorms that accompanied the front produced damagin winds and torrential rains. Trees and power lines were downed, wit scattered power outages reported. Roads were closed in Irondequoit and Ishua. Additionally, NWS Buffalo Office data on flash floods indicated basement
				and road flooding in Irondequoit.
August 29, 2004	Flash Flood	N/A	N/A	A cold front stretching across the lower Great Lakes became nearl stationary. Occasional showers and thunderstorms persisted along the fror during the late morning and early afternoon hours. The thunderstorm winds estimated to 60 mph, downed trees and power lines in Caledonia Livingston County; Henrietta and Brighton, Monroe County; Croghar Lewis County; and Lorraine, Jefferson County. The training thunderstorm produced heavy rains, leaving parts of Monroe and Wayne Counties under water up to waist high. Weather radar estimated that rainfall totaled 4 to inches over parts of those counties.
				Additionally, NWS Buffalo Office data on flash floods indicat widespread street flooding in Rochester.



Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
August to September, 2004	Severe Storms and Flooding	DR-1564	Yes	Monroe County did not activate the EOC for this event. Hurricane Frances, "inundated western and central New York with drenching rain as its remnants drifted north across the region. Areawide rainfall totaled 3 to 5 inches with the bulk of it falling in a 6- to 9-hour period from very late September 8th to midday September 9th. Several creeks recorded their greatest flows and highest gage levels ever in a non-winter/spring season. The heaviest rain was in a swathacross Monroe and western Wayne counties, with between 3.5 to 4.5 inches" (NWS, The Lake Breeze, Spring 2006). The NYS, Buffalo Office issued a Flood Warning (0300 hours). Three villages and one town declared States of Emergency due to flooding and road closures. The Hilton Fire Department evacuated its Fire Station due to flooding. The Red Cross and local community shelters housed 163 evacuees. The Ogden Highway Superintendent evacuated two houses on Washington Street because flood waters from the Erie Canal had reached the first floor windows. OEM distributed 1,350 sandbags. The Red Cross distributed 75 clean-up kits. FEMA opened a Disaster Recovery Center at the Ogden Town Hall (November 22 – December 3, 2004) and deployed a Community Relations Team. FEMA financial assistance: \$256,481 – Public Assistance; \$1,964,092.96 – Individual Assistance; and \$72,426 – Mitigation, HMGP (OEM Disaster Response File).
September 9, 2004	Flood	N/A	N/A	Western and central New York were inundated by drenching rains as the remnants of hurricane Frances drifted north across the region on Thursday September 9th. Areawide rainfall totaled 3 to 5 inches, with the bulk of it falling within a 6- to 9-hour period from very late Wednesday to midday Thursday. Several creeks in the Buffalo and Rochester areas recorded their greatest flows and highest gage levels ever in a non-winter/spring season.
April 3, 2005	Flood	N/A	N/A	Deep low pressure over Pennsylvania brought copious amounts of precipitation to western and central New Yorkfalling mainly as rain across much of the area. Rainfall totals generally ranged from 2 to 3 inches. The rain, combined with snowmelt, produced flooding. Basement flooding was reported in Gorham and Rochester. The heavy rains produced slick roads that were blamed for numerous automobile accidents in Monroe and Wayne Counties. Six area creeks and rivers reached flood stage.





COF NEWX				
Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 10, 2005	Flash Flood	N/A	N/A	Slow moving thunderstorms produced 2 to 2.5 inches of rain within an hour over parts of Livingston and Monroe Counties. Creeks overflowed, and roads and homes flooded. Additionally, NWS Buffalo Office data on flash floods indicated basement flooding in Charlotte.
July 14, 2005	Flash Flood	N/A	N/A	Thunderstorms developed in an unseasonably hot and humid airmass during the late afternoon and early evening hours. The storms downed trees and power lines in Rochester, Lockport, Evans, Batavia, Orchard Park, and Spencerport. A house chimney was damaged by the downburst winds in Rochester. In Chili, a woman was slightly injured while talking on the telephone when lightning traveled through the home's telephone line. Also in Chili, a house fire on Chili Avenue Extension was blamed on a lightning strike. The heavy rains that accompanied the storms resulted in flash flooding in parts of Lewis and Monroe Counties. In the Rochester metro area, numerous reports were received of flooded roads and basements. In Turin, the flood waters washed out a portion of Fish Creek Road. Additionally, NWS Buffalo Office data on flash floods indicated basements flooded in Chili.
July 16-17, 2005	Flood	N/A	N/A	More than 0.5 inch of rain fell within 60 minutes and 20 minutes, respectively, during these evenings. The NYS, Buffalo Office reported that strength of the rain caused streets to look and feel like creeks. Lightning struck a house and caused a fire" (Democrat & Chronicle, July 18, 2005).
September 16, 2005	Flood	N/A	N/A	"More than 2 inches of rain fell in the Rochester area within the span of three hours and 3.08 inches for the entire day. The amount broke a 130-year record of the daySome residents experienced a severe backup of sewer lines into their basement. Water from flooded streets was blamedas well as surcharging of basement drains" (Democrat & Chronicle, October 22, 2005). "This rainfall fits the definition of flash flooding" (Democrat & Chronicle, September 18, 2005).





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 26-28, 2006	Flooding	N/A	N/A	Monroe County resources responded to flooded Southern Tier counties when called for Mutual Aid. Ambulances, Special Operations tactical teams from the Fire Service, and 911 Dispatchers deployed in Task Forces and Strike Teams through requests from the NYS Fire Mobilization Plan, the NYS Department of Health, and local Emergency Managers for assistance with specific assets (OEM Disaster Response File).
July 12, 2006	Flash Flood	N/A	N/A	A warm front stretching across the region focused heavy rain over the counties along the south shore of Lake Ontario. Two to 4 inches fell across Orleans and Monroe Counties, with more than 5 inches over a portion of Wayne and northern Cayuga Counties. The rains inundated roads, buildings, and crops. Sections of roads were washed away in Wolcott, Irondequoit, and Webster, among others. Cars damaged in high water numbered in the thousands. States of Emergency were declared in several towns and villages, including Wolcott. The rain water inundated agricultural fields, and hundreds of thousands of dollars' worth of squash, potatoes, and corn were ruined.
				Rochester's rainiest July day on record (3.33 inches) overflowed creeks, flooded basements, and even created sinkholes behind some Irondequoit homes. Thirty percent of city firefighters' calls were for water-related problems. In Irondequoit, the force of water pushing through a drainage system forced the ground to implode, creating a 25-foot-wide by 10-foot-deep crater. The heavy showers came in a series of training storms. Flooding closed a portion of Interstate Route 390, and stranded cars in several shopping center parking lots. NYS Route 404 was closed after a 25-foot-wide sinkhole formed. Localized flash flooding resulted in drain and sewer back-ups, many of them clogged by debris. The County Health Department discouraged swimming in Lake Ontario for 72 hours due to heavy discharge from streams, bays, and the Genesee River (Democrat & Chronicle, July 13, 2006; July 14, 2006). The Erie Canal was re-opened. A significant stretch had been closed due to flooding, stranding boaters for up to 2 weeks
				(Democrat & Chronicle, July 15, 2006). Additionally, NWS Buffalo Office data on flash floods indicated Rochester I-390 closed.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
July 28, 2006	Flood	N/A	N/A	"Heavy rain caused flooding and accidents throughout the area. Parts of the Empire State Games were delayed. Nearly 2 inches of rain fell at the Airport, and 3 inches fell in Webster. Numerous accidents were reported and NYSDOT closed a portion of Route 104 due to flooding. Rochester firefighters pumped water from the roof of Rural/Metro Medical Services. And, the rainfall is believed to have caused a landslide in Irondequoit at German Village" (Democrat & Chronicle, July 29, 2006).
March 14, 2007	Flood	N/A	N/A	Saturated ground, snowmelt from warm weather, and additional rainfall constituted ideal conditions for spring flooding. Thirteen of the area river and creek forecast points exceeded flood stage.
March 15, 2007	Flood	N/A	N/A	Saturated ground, snowmelt from warm weather, and additional rainfall constituted ideal conditions for spring flooding. Thirteen of the area river and creek forecast points exceeded flood stage. (Continuation of event from day prior.)
April 15-28, 2007	Coastal Flood	N/A	N/A	A Nor'easter that battered the East Coast affected our area beginning on the 15 th , with the NWS, Buffalo Office issuing a Coastal Flood Advisory that included the Lake Ontario shoreline in Monroe County. The 911 Center deployed "HyerReach" calls to more than 2,200 homes along the shore to inform occupants of the impending flood threat and to encourage them to take precautionary measures in response to the rising water. The County Parks Department placed sandbags around the historic carousel at Ontario Beach Park to mitigate wave run-up and water damage. NOTE: Subsequent to this storm, Monroe County provided sandbags to shoreline municipalities for residential and business flood fighting efforts. Conditions in other areas affected airline transportation, imposing delays and cancellations at the Rochester Airport. About 4.7 inches of snow prompted extended shifts for DPW crews and several motor vehicle accidents. Black Creek flooded on the 17th, prompting a Flood Warning by the NWS, Buffalo Office. Monroe County closed Ellison Park due to flooding on Irondequoit Creek. The city fire department responded to about 25 structural damage calls due to the weather. Precipitation on the 16th set a new daily record of 1.1 inches of rain at the Airport (Democrat & Chronicle, April 16, 2007; April 18, 2007; OEM Disaster Response File; Monroe County New Release, April 30, 2007).





C OF NEW				
Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
April 2007	High Levels	N/A	N/A	"A nor'easter earlier in April, recent rainfall and snow that's still melting have delayed the opening of New York's canal system, traditionally scheduled to open on May 1st. Until water levels recede, operations to place water control structures in position and set buoys and other critical navigational aids cannot commence" (Democrat & Chronicle, April 30, 2007)." " 'The flooding from last month's nor'easter might seem mild if the thousands of dams in the state continue to decline,' Senator Charles Schumer said. There are nearly 2,000 federally recognized dams in New Yorkand the April storm exposed serious flaws in dams." (Democrat & Chronicle, May 8, 2007).
July 23, 2008	Flash Flood	N/A	N/A	Thunderstorms developed across the area, including in Monroe County, as an upper level low was centered over the Great Lakes region. Storms developed rapidly along an outflow boundary from the Niagara Peninsula to Erie County. Thunderstorms that developed produced damaging winds estimated to 60 mph and hail measured up to 1 inch in diameter. Scattered power outages were reported. The storms also dropped several inches of rain within a short span of time over parts of Rochester, resulting in flash flooding. Nearly 1 foot of water across the road resulted in closing of portions of Interstates 490 and 390 for several hours right at the start of the evening rush hour. Additionally, NWS Buffalo Office data on flash floods indicated 2W Rochester Rte 490 closed between Mt. Read and 390.
December 28, 2008	Flood	N/A	N/A	Unseasonably warm temperatures in the 60s, combined with 1.25 inches of rain, melted a snowpack of 4 to 8 inches. This resulted in flooding of creeks and streams in western NYS. In Monroe County, low-lying areas, roadways, and basements flooded, and some evacuations were ordered.
February 12, 2009	Flood	N/A	N/A	A major thaw and additional rainfall resulted in rapid snowmelt and runoff, with several area creeks exceeding their flood stages. Two to 5 inches of water in the snowpack quickly melted as temperatures climbed into the upper 50s and 60s. Some backyard and basement flooding occurred from Churchville to Chili.





OF NEWX				
Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
March 9, 2009	Flood	N/A	N/A	Soaking rains over a 4-day period beginning on the 7th provided the region (including Monroe County) with nearly all of the month's precipitation, between 2 and 3 inches. The rain combined with the melting winter snowpack and frozen ground to result in widespread flooding on area rivers and creeks. Numerous reports of road closures along those rivers and creeks were received. This was the third winter flood event this season, a rare occurrence in western NYS.
June 2009	Flood	N/A	N/A	"The last week of June featured a variety of weather (including) thunderstorms that produced localized flooding (in Monroe County)" (Democrat & Chronicle, July 2, 2009).
July 13, 2010	Flash Flood	N/A	N/A	An area of low pressure slowly moved across the region, bringing rainfall amounts of up to 2 inches in some areas. The heavy rains produced localized flash floods that flooded some homes and roads. Roads reported closed by flood waters included: Blossom Road in Rochester (three cars stuck in water at least 3 feet deep), County Route 26 in Canadice and Richmond (a mudslide deposited up to 4 feet of mud in some areas), State Route 64 in Bristol Center (closed from County Rte 32 to Dugway Road), and County Route 33 in Honeoye. At 1447 hours, the NYS, Buffalo Office issued a Flash Flood Warning for "Eastern Monroe County, including the City of Rochester, Irondequoit, East Rochester and Brighton until 1745 hours" (NWS Bulletin, July 13, 2010).
August 14, 2011	Flash Flood	N/A	N/A	Heavy rains and embedded thunderstorms dropped up to 4 inches of rain over parts of the region within just a few hours. Flash flooding occurred in Allegany County, where roads were flooded and closed in Cuba and Canadea. In metro Rochester, Monroe County, major roads such as I-490 and I-590 were closed. Cars were submerged to the windows in some areas Flash flooding was also reported in Webster and Irondequoit.
April 13, 2013	Flood	N/A	N/A	A warm frontal boundary lifted north and stalled across the lower Great Lakes, leading to a period of significant rainfall across the region between the 9th and 12th. The rainfall pushed many area streams and creeks in western NYS above action stage. Black Creek at Churchville exceeded flood stage (6 feet) for around 21 hours, cresting at 6.37 feet. This resulted some backyard and basement flooding in Churchville and Chili.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 13, 2013	Flood	N/A	N/A	A warm front associated with a low pressure system that moved across the Ohio Valley and Pennsylvania resulted in a swath of 1 to 2 inches of rain from the Rochester metro area east to near Fulton. This created minor flooding issues on area roadways, along with flooding of Ellison Park in Rochester when Irondequoit Creek rose above bankful. The creek crested at 9.23 feet around 4 p.m. on the 14 th , and receded to its banks on the morning of the 15th.
July 3, 2013	Flood	N/A	N/A	Thunderstorms developed over the northern Finger Lakes along a lake breeze in a warm humid air mass. The thunderstorms produced damaging winds that downed trees and power lines. These were reported in Shelby Center, Fairport, Pittsford, Macedon, Palmyra, Newark, and Lyons. The thunderstorms also produced hail up to 1 inch in diameter in Waterport. Between 1.5 and 2.5 inches of rain was measured across parts of Monroe and Wayne Counties. This amount of rain within a very short time resulted in poor drainage flooding in the City of Rochester. Several city streets were inundated, included Amsterdam Road and Monroe Avenue.
December 22, 2013	Flood	N/A	N/A	A surface front stalled across the region acted as a pathway for periods of heavy precipitation. Rainfall amounts of 1.5 to 3.0 inches fell across the Niagara Frontier and parts of the Genesee Valley and Finger Lakes. The heavy rain combined with snowmelt to produce flooding. In addition to many of the gauged rivers and creeks reaching flood stage, flooding in low- lying and poor drainage areas was common. In urban areas, runoff of the heavy rain and snowmelt was hindered by snow- and ice-clogged storm drains.
May 13-22, 2014	Flood	DR-4180	No	On the 16 th , heavy rain along a slow moving cold front produced flooding across parts of the Genesee River valley and Finger Lakes region. Rainfall amounts of 2 to 3 inches fell on already rain-soaked soils. Honeoye Creek crested at 5.63 feet, a moderate flood. It was the fourth highest crest on record, causing flooding in and around the Village of Honeoye Falls. Roads were reported flooded in Monroe County in Brighton and Fairport. Resulting damages were enough to warrant a State Disaster Declaration. Monroe County had a public sector cost of \$87,377.48 for flood damages or other costs (i.e. labor costs associated with maintaining sewer systems) for this event.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
July 28, 2014	Flash Flood	N/A	N/A	Low pressure slowly moved across western and central New York, and brought heavy rains and embedded thunderstorms to the region. Rainfall totaled 3 to 6 inches during the afternoon hours and resulted in flash flooding in several areas of the Finger Lakes region. In Monroe County, flooding was reported in Riga, Caledonia, and South Chili. The NYS Thruway was forced to close between Exits 46 and 47. In Honeoye, a bridge on Cole Road washed out, as did portions of Egypt Road in Bristol.
August 1, 2014	Flood	N/A	N/A	Thunderstorms developed in a moderately unstable airmass along the lake breeze boundary that extended across the lower Genesee Valley and Western Finger Lakes. The thunderstorms produced damaging winds that downed trees and wires in Greece and Newark. Hail also fell during the storms: 1-inch hail was reported in Rochester, and 0.75-inch hail covered the ground in Newark. Heavy rains resulted in urban flooding. Storm sewers could not contain flows from the intense rainfall, and streets closed in Newark and Greece.

Source(s): FEMA 2014, NYS DHSES 2014, NCDC 2014, NWS 2010; Democrat & Chronicle 2010; USACE 2010; Monroe County 2010

Notes:

Monetary figures within this table are U.S. Dollar (USD) figures calculated during or within the approximate time of the event. If such an event would occur in the present day, monetary losses would be considerably higher in USDs as a result of increased U.S. Inflation Rates.

- DHSES Division of Homeland Security and Emergency Services
- DPW Department of Public Works
- DR Federal Disaster Declaration
- EOC Emergency Operations Center
- FEMA Federal Emergency Management Agency
- FIS Flood Insurance Studies
- HMGP Hazard Mitigation Grant Program
- mphMiles per hourN/ANot applicable
- NCDC National Climate Data Center
- NOAA National Oceanic and Atmospheric Administration
- NYS New York State
- NYSDOT New York State Department of Transportation
- OEM Office of Emergency Management
- USACE U.S. Army Corps of Engineers





Known severe storm events that occurred from 1972 to 2015 are identified in Table H.4. With severe storm documentation for New York State and Monroe County being so extensive, not all sources have been identified or researched. Therefore, Table H.4 may not include all events that have occurred in the County.





Table H.4. Severe Storm Events between 1972 and 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 23, 1972	Tropical Storm Agnes	DR-338	Yes	Not listed.
June 6, 1973	Thunderstorm Wind	N/A	N/A	Unofficially, the Rochester Airport (at the FAA Tower) had a wind gust of 100 mph (Democrat & Chronicle, 2.22.06, 2.12.09).
November 12, 1992	Thunderstorm Wind	N/A	N/A	The County EOC was activated for 13.25 hours for a severe wind storm that knocked out power, and downed trees and power lines (County Office of Emergency Management, Disaster Response File: 1992 Wind Storm).
August 13, 1993	Thunderstorm Wind	N/A	N/A	Thunderstorms developed in a moist flow ahead of a cold front. The thunderstorm winds downed trees and power lines. Hail up to an inch in diameter was reported with the storms. Some structural damage was reported from fallen trees and limbs. Damage was estimated at \$4,000.00 for Fairport.
August 28, 1994	Thunderstorm Wind	N/A	N/A	Thunderstorms developed in a moist, southwest flow ahead of a cold front. The thunderstorm winds downed trees and power lines, resulting in power outages scattered across the region, including Webster and Spencerport. Damage was estimated at \$4,000.00.
June 26, 1995	Thunderstorm Wind	N/A	N/A	Severe thunderstorms moved across portions of Western and Central New York. The thunderstorm winds downed trees and power lines. Power outages were scattered across the entire area. Damage estimates were \$6,000.00 for Pittsford and \$10,000.00 for Macedon Center.
July 6, 1995	Thunderstorm Wind	N/A	N/A	Severe thunderstorms moved across the area ahead of a cold front. There were numerous reports of downed trees and wires and power outages. Damage was estimated at \$8,000.00 for Penfield.
July 15, 1995	Thunderstorm Wind	N/A	N/A	The County EOC was activated for 3 hours to assist coordination of resource identification and deployment to northern New York State after a "Wind Burst" (County Office of Emergency Management, Disaster Response File: July 1995 North Country Wind Burst).
July 17, 1995	Thunderstorm Wind	N/A	N/A	Thunderstorms with wind caused damage estimated at \$4,000.00 for Brockport.
August 3, 1995	Thunderstorm Wind	N/A	N/A	Severe thunderstorms crossed the area resulting in fallen trees and power lines, nearly continuous lightning and record rainfall. In Monroe County, traffic was disrupted by flash flooding caused by over 2 inches of rain in a very short time. Numerous power outages were also reported. Damage was estimated at \$25,000.00 for Rochester, \$5,000.00 for Henrietta, and \$35,000.00 for the county.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
August 31, 1995	Thunderstorm Wind	N/A	N/A	A fast moving line of severe thunderstorms crossed the region causing widespread damage. There were countless reports of downed trees and power lines, many onto cars and houses. Several SKYWARN observers recorded wind gusts of 60-70 mph as the storms moved through. Damage was estimated at \$8,000.00 for Irondequoit.
January 27, 1996	Thunderstorm Wind	N/A	N/A	Deep low pressure over the upper Great Lakes brought strong winds to the area. The high winds downed trees and power lines in Mendon. Damage was estimated at \$15,000.00.
March 25, 1996	Thunderstorm Wind	N/A	N/A	Thunderstorms accompanying a cold front produced damaging winds, which downed trees and power lines. Damage was estimated at \$20,000.00.
April 20, 1996	Thunderstorm Wind	N/A	N/A	Severe thunderstorms developed in the late afternoon. The thunderstorms dropped large hail across the region. Thunderstorm winds downed trees and power lines. Damage was estimated at \$15,000.00 for Hamlin.
May 20, 1996	Thunderstorm Wind	N/A	N/A	A line of severe thunderstorms crossed the area producing damaging winds. The thunderstorm winds downed trees and power lines. In Riga, the winds damaged a large road sign. Damage was estimated at \$35,000.00.
June 22, 1996	Thunderstorm Wind	N/A	N/A	Severe thunderstorms produced damaging winds, which downed trees and power lines. Damage was estimated at \$8,000 for Irondequoit.
October 30, 1996	Thunderstorm Wind	N/A	N/A	Low pressure moving northeast across Lake Superior brought strong winds to the area. The winds brought down trees, tree limbs, and power lines. In Penfield, two persons were injured when a tree fell on the car they were driving. Winds gusted to 52 mph. Damage was estimated at \$25,000.00.
February 22, 1997	Thunderstorm Wind	N/A	N/A	A strong cold front crossed the region during the morning hours. Temperatures dropped 40 to 45 degrees with the passage of the front. The funneling effect of the Great Lakes combined with rapid pressure rises behind the front combined to produce hazardous winds. Trees, power lines, and poles were downed across the entire area. Hundreds of thousands were left without power. Reports of homes and autos damaged by the falling trees and branches were numerous. The strong winds caused structural damage in some locations tearing off roofs and shingles, blowing-out windows, and collapsing walls. Air travel from the Buffalo and Rochester airports was interrupted. A 54-year-old volunteer fireman was killed in Spencerport while responding to an emergency call when a large tree fell on his car, crushing him. His 15-year-old son also riding in the car suffered injuries. Reported gusts included: 61 knots at Rochester. Damage was estimated at \$500,000.00.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
February 27, 1997	Thunderstorm Wind	N/A	N/A	Deep low pressure moved from Indiana to Ontario bringing high winds to the area. The strong winds downed trees and telephone and power lines. Power outages were reported throughout the area. Several cities and towns declared States of Emergency because of the prolonged lack of power. Windows were blown-out of buildings. The strong winds caused structural damage in some locations tearing-off roofs and sidings and collapsing walls. Home and autos were damaged by falling limbs. An electric lineman was injured in Perinton, when he was knocked from a pole by a falling tree. Damage was estimated at \$150,000.00.
July 15, 1997	Thunderstorm Wind	N/A	N/A	Strong thunderstorms crossed the region during the afternoon hours. The thunderstorm winds downed trees and power lines. Scattered power outages lasting several hours were reported. In Henrietta, numerous utility poles were downed by the thunderstorm winds leaving nearly 24,000 customers in the Rochester area without power for several hours. Damage was estimated at \$75,000.00 for Henrietta.
September 29, 1997	Thunderstorm Wind	N/A	N/A	Severe thunderstorms rolled across the area during the evening hours producing damaging winds estimated at sixty to seventy miles per hour. The winds downed trees and power lines and resulted in thousands being left without power. Damage was estimated at \$15,000.00 for Penfield.
March 28, 1998	Thunderstorm Wind	N/A	N/A	A fast moving squall line crossed the area during the afternoon hours. Winds, gusting over 70 mph, downed numerous trees and wires. Power outages were reported throughout the area. Damage was estimated at \$40,000.00.
May 31, 1998	Thunderstorm Wind	N/A	N/A	An outbreak of severe storms began across the region during the early morning hours. The storms were particularly dangerous because of their speed moving across the region – sometimes in excess of 60 mph. Most of the damage associated with these storms occurred from a combination of high winds and hail. There were reports of numerous trees and wires down as well as power outages. Tens of thousands were without power. Several flights were delayed or cancelled at the Buffalo and Rochester airports due to the storms. Damage was estimated at \$18,000.00 for Gates Center, \$17,000.00 for Hamlin, \$15,000.00 for Scottsville, and \$15,000.00 for Rochester. A person in Henrietta was struck by lightning. A second round of storms for the day moved across the region during the evening hours. Again the thunderstorms produced high winds, large hail and torrential rains. Trees and power lines were downed across western New York. In the Rochester area, the power company reported 30 poles snapped by the winds and 40,000 customers were without power. Lightning throughout the area shattered trees and set a number of fires. At Locust Hill Country Club, the nationally televised Ladies Pro Golf Association tournament was delayed four times by the storms. Damage was estimated at \$30,000.00 for Rochester.
June 16, 1998	Thunderstorm Wind	N/A	N/A	Scattered thunderstorms crossed the area during the early evening hours. The thunderstorm winds downed trees and power lines. The heavy rains, which accompanied the thunderstorms, resulted in widespread poor drainage and urban flooding in the Rochester metro area. Damage was estimated at \$40,000.00 for Rochester.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 25, 1998	Thunderstorm Wind	N/A	N/A	Thunderstorms, accompanied by almost continuous lightning, torrential rains, damaging winds, and pea to marble-sized hail swept across the area. Over 15,000 were without power when thunderstorm winds downed power lines and poles. Damage was estimated at \$10,000.00 for Webster.
August 24, 1998	Thunderstorm Wind	N/A	N/A	Thunderstorms moved across the southern Lake Ontario counties during the early morning hours. The thunderstorms produced damaging winds, which downed trees and power lines. Several thousand customers were left without power for several hours. Winds were estimated in some areas at 60-70 mph. Damage was estimated at \$50,000.00 for Greece.
September 6-7, 1998	Thunderstorm Wind	N/A	N/A	Several thunderstorms moved onshore over northeast Niagara County shortly before midnight. The line of storms quickly moved across Orleans, Monroe, Wayne, Ontario and northern Cayuga counties. Across the area the damage path was nearly 100 miles long and 5 to 10 miles wide. Winds were estimated between 80 and 100 mph throughout the 2-hour event. Along the entire path, damage and debris all laid in an easterly direction consistent with the damage from straight-line winds. Most of the damage consisted of downed trees and limbs. The falling trees and limbs in-turn downed power and telephone lines and resulted in damage to buildings and automobiles. Power outages, some lasting nearly a week, were widespread across parts of Orleans, Monroe and Wayne counties. Hundreds of thousands of customers were without power. The strong winds themselves also resulted in structural damage to homes, barns and buildings along the path including some in Brockport and Bushnell's Basin among other locations. Several aircraft were damaged at the Rochester Airport where wind gusts were measured at 89 mph. States of Emergency were declared throughout Monroe and Wayne counties and sections of Orleans County. Monroe, Wayne, and Cayuga counties were declared federal disaster areas. The strong winds severely damaged apple crops and trees from Niagara across Orleans and Monroe through Wayne counties. Damage was estimated at \$20 million for the Rochester Airport, \$350,000.00 for Brockport, \$1.2 million for Pittsford, and \$2 million in crop damages. This storm, known locally as the "1998 Labor Day Windstorm," was later classified by the National Weather Service as a derecho. Its associated straight line winds were predominant on a path that followed the Erie Canal and NYS Route 31, from Orleans County stretching almost to Albany. The County EOC was open for 113.75 hours. The Presidential Disaster Declaration on September 22, 1998 for seven counties identified this storm as FEMA-1244- DR-NY. Reimbursement to all counties for public assistance wa





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
November 10, 1998	Thunderstorm Wind	N/A	N/A	Low pressure over the central plains moved across the Great Lakes and brought high winds to western New York and the North Country. The strong winds, gusting to 62 mph, brought down tree limbs and power lines across the region. Several windows were blown-in. In East Rochester, several buildings were damaged as walls were blown-in. One cinderblock wall was over 30 feet high and 100 feet long. Thousands were without power as outages were scattered across the area. Power outages were reported in Victor and Rochester as well as other cities and towns in the region. Damage was estimated at \$150,000.00.
July 3, 1999	Thunderstorm Wind	N/A	N/A	Several thunderstorms crossed the region during the late afternoon hours. The thunderstorms produced heavy downpours, up to three inches in some spots, strong winds and large hail. The heavy downpours resulted in localized poor drainage flooding. The strong winds downed trees and power lines throughout the region. Structural damage was also reported. Greece reportedly had \$25,000.00 in damage.
July 24, 1999	Thunderstorm Wind	N/A	N/A	Severe thunderstorms developed across the counties along the south shore of Lake Ontario. The thunderstorms produced downpours and strong winds. The damaging winds downed trees and power lines with scattered outages reported. Greece reportedly had \$15,000.00 in damage.
July 31, 1999	Thunderstorm Wind	N/A	N/A	Violent thunderstorms ripped across western New York and the Finger Lakes Region during the evening hours. The strong thunderstorms downed trees and power lines and left hundreds of thousands without power. Several roads were blocked by fallen debris. Several of the falling trees caused damage to houses and automobiles. In Monroe County, at the Freeman Park in Mumford four people at a company picnic were injured when high winds picked up a tent and dragged it through the crowd. They were treated and released from an area hospital.
August 4, 1999	Thunderstorm Wind	N/A	N/A	Severe thunderstorms crossed the Finger Lakes during the late afternoon hours. The thunderstorms produced damaging winds, which downed trees and power lines. Damage was estimated at \$8,000.00 for Rochester.
October 13, 1999	Thunderstorm Wind	N/A	N/A	A strong cold front crossed the area. The thunderstorms that accompanied the front produced damaging winds and large hail. The winds downed trees and power lines. About 10,000 customers lost their power. Falling trees damaged houses in Webster among other areas. Damages in Webster were estimated at \$35,000.00.
November 2, 1999	Thunderstorm Wind	N/A	N/A	An intense storm, which moved from the eastern Gulf of Mexico to New Western New York, brought high winds to the region. Trees and lines were downed and power outages were scattered throughout the area. In Rochester, an overhead highway sign was blown into the path of a minivan. A 41-year-old male driver died, while his wife and daughter were not injured in the accident. Damage was estimated at \$100,000.00.
January 4, 2000	High Wind	N/A	N/A	Strong winds accompanied the passage of a cold front across the area during the late morning and early afternoon hours. Trees and power lines were downed by the winds. In Rochester, a smokestack was blown over. Gusts of 55 mph at Rochester were recorded. Power outages were scattered throughout the area. Damage was estimated at \$50,000.00.





		FEMA		
Dates of Event	Event Type	Declaration Number	County Designated?	Losses / Impacts
March 9, 2000	Thunderstorm Wind	N/A	N/A	Spring thunderstorms rolled-in off Lake Ontario during the afternoon hours. The storms produced 3/4 inch hail and damaging winds that downed trees and power lines. Damage was estimated at \$25,000.00.
May 12, 2000	Thunderstorm Wind	N/A	N/A	Thunderstorms rolled across the Niagara Peninsula and then along the Lake Ontario shore counties. Only small hail was reported with the storms, however the storms produced hurricane-force winds. The high winds buffeted the area taking down trees and power lines. Various communities reported power outages of 12 hours or more. In Irondequoit, Kings Highway and Bayview Road caved-in as a result of erosion. Damages in Gates Center were estimated at \$35,000.00.
May 24, 2000	Thunderstorm Wind	N/A	N/A	Thunderstorms roared across the Genesee Valley and the Finger Lakes Region during the late morning and early afternoon hours. In addition to producing hail up to one inch in diameter, the thunderstorms produced damaging winds. Damage was estimated at \$8,000.00 for Henrietta.
August 1, 2000	Thunderstorm Wind	N/A	N/A	Thunderstorms developed along lake breezes during the afternoon hour. The thunderstorm winds downed trees and power lines. In addition to producing hail up to an inch and a quarter in diameter, the thunderstorms produced torrential rains, which resulted in localized poor drainage flooding. Damage was estimated at \$25,000.00 for Brockport.
December 12, 2000	Thunderstorm Wind	N/A	N/A	Deep low pressure over Ohio tracked northeast across the region. The strong pressure gradient on the back side of the low combined with rapid pressure rises resulted in very strong northwest winds across the region. The damaging winds downed trees and lines throughout the area. Specific reports of damage were received from Spencerport along with many other areas outside of Monroe County. Nearly 100,000 customers were without power across the region. Flights on the morning of the 12th were either delayed or cancelled at both the Buffalo Niagara International Airport and the Rochester Airport. Damage was estimated at \$200,000.00.
February 10, 2001	Thunderstorm Wind	N/A	N/A	Deep low pressure over the western Great Lakes moved across Ontario to Quebec and dragged a cold front across the area. Sustained winds of 20 to 30 mph were reported across the area with recorded gusts up to 76 mph. The strong winds downed trees and utility lines throughout the 14-county area. Several hundred thousand customers were without power. Roads were blocked by downed trees. There were numerous reports of property damage from the winds, mostly from trees falling on buildings and cars. Specifically, this was reported from Pittsford and Honeoye Falls along with many other areas outside of Monroe County. In Fairport, a winter carnival had to be cancelled because the high winds tore apart a large tent erected for the carnival. Damage was estimated at \$300,000.00.
February 25, 2001	Thunderstorm Wind	N/A	N/A	Deep low pressure over the northern Great Lakes moved northeast to Quebec and pulled a strong cold front across the area. The strong winds that accompanied the system downed trees and power lines. Sustained winds of 51 mph were reported at the Rochester Airport. Damage was estimated at \$100,000.00.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
May 27, 2001	Thunderstorm Wind	N/A	N/A	Thunderstorms crossed the area during the afternoon hours producing hail up to ³ / ₄ inch in Gates Center and damaging winds estimated to 68 mph. Trees and power lines were downed by the strong winds in western Monroe County. Damage was estimated at \$5,000.00 in Gates Center and \$20,000.00 in Rochester.
July 1, 2001	Thunderstorm Wind	N/A	N/A	Thunderstorms ahead of a cold front crossed the western Finger Lakes Region and Eastern Lake Ontario counties during the morning hours. The storms produced damaging winds, which downed trees and power lines across the area. Damage was estimated at \$10,000.00 in Webster.
July 10, 2001	Thunderstorm Wind	N/A	N/A	Strong thunderstorms moved across parts of the Finger Lakes Region during the late evening hours. The storms downed trees and power lines in Chili. Damage was estimated in Chili Center at \$10,000.00.
February 1, 2002	Thunderstorm Wind	N/A	N/A	An intensifying storm moved across the Great Lakes and lifted northeast to the St. Lawrence Valley. Very strong winds behind the low blasted the region with wind gusts exceeding 55 mph. Trees and power lines were downed by the strong winds. Hundreds of thousands were without powersome for several days. Fallen trees and limbs littered the area and closed roads. Numerous reports of damage to homes and automobiles were received from throughout the area. Driving bans and States of Emergency were declared in several counties. Numerous school districts were forced to close on the first and several remained closed through the beginning of the following week. In Monroe County, two injuries resulted from the high winds. A man was briefly hospitalized after gusts blew apart the trailer he was working in at the Greater Rochester Airport. Also in Rochester, a woman was blown from the sidewalk into the street where she was hit by an oncoming car. Damage was estimated at \$750,000.00.
March 3, 2002	Thunderstorm Wind	N/A	N/A	Low pressure over Indiana deepened as it moved northeast. Trees and power lines were downed. Damage was estimated at \$100,000.00.
March 9, 2002	Thunderstorm Wind	N/A	N/A	Low pressure over Wisconsin deepened as it moved across Lake Superior and into northern Ontario. Strong winds accompanied and followed the passage of a cold front. The damaging winds affected the entire area, downing trees and power lines and causing some structural damage. Nearly 100,000 customers completely lost power with thousands of others experiencing brief power outages. In Rochester, a roof was blown-off a building supply store. In Mendon, a two-story, 100-year old barn was pushed over. Damage was estimated in Webster at \$50,000 and overall at \$500,000.00.
April 28, 2002	Thunderstorm Wind	N/A	N/A	Thunderstorms developed across the eastern Great Lakes Region during the afternoon hours. The thunderstorm's downburst winds ripped down trees and power lines. Scattered power outages were reported. Several structures and automobiles were damaged by falling trees. Wind damage was estimated at \$10,000.00 in Henrietta.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
May 29, 2002	Thunderstorm Wind	N/A	N/A	Thunderstorms developed in warm, moist, unstable air during the afternoon and evening hours downing trees and power lines. Up to 5,000 homes were without power at the peak of the storm. Damage was estimated at \$25,000.00 for the Rochester Airport.
May 31, 2002	Thunderstorm Wind	N/A	N/A	Thunderstorms moved across the region ahead of a cold front. The thunderstorms produced damaging winds and hail up to ³ / ₄ inch in diameter. The winds downed trees and power lines and scattered power outages were reported. A home suffered damage in Bushnell's Basin. Damage was estimated at \$50,000.00 in Bushnell's Basin.
June 26, 2002	Thunderstorm Wind	N/A	N/A	Thunderstorms developed in a warm, moist, unstable flow during the late morning and afternoon hours. Eight thousand customers lost power in the Rochester metro area. Damage was estimated at \$35,000.00 in Rochester, and \$30,000.00 in Irondequoit.
June 27, 2002	Thunderstorm Wind	N/A	N/A	Thunderstorms developed ahead of an approaching cold front. The thunderstorms produced damaging winds which gusted to near 70 mph. Damages consisted mainly of downed trees and power lines, although some structural damage occurred. Damage was estimated in Greece at \$20,000.00.
May 11, 2003	Strong Winds	N/A	N/A	Spencerport had straight-line winds (60-70 mph) with a localized microburst. A microburst is defined as a, "Highly localized downburst of air released from within a thunderstorm. Winds associated with microbursts can exceed 150 mph. That is equal to the force of an F-2 tornado" (Glenn Johnson, Meteorologist, Democrat & Chronicle, 5-14-03).
April 18, 2004	Hail	N/A	N/A	Spencerport: 0.88 inches; Fairport: 0.88 inches
May 14, 2004	Thunderstorm Wind	N/A	N/A	In Greece, trees fell down on a house, E50 KT; Rochester had trees down, E50KT
May 20, 2004	Lightning	N/A	N/A	An electrical storm followed by a heavy downpour rolled into the Rochester area shortly after 8:00 p.m." Lightning struck the First Presbyterian Church in the Village of Pittsford. About 30 people were attending choir practice. Everyone was safely evacuated, but there was major damage to the structure (Democrat & Chronicle, 5.21.04, 5.22.04).
May 22, 2004	Thunderstorm Wind	N/A	N/A	Spencerport had numerous trees down, E50KT





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
May 23, 2004	Thunderstorm Wind	N/A	N/A	Henrietta's Memorial Day Parade was canceled due to thunderstorms. "Frontier officials say recent storms have knocked out telephone service for an estimated 1,100 business and residential customers across the Rochester region. The company has no official estimate for when most customers will regain service (some maybe 3 days)" (Democrat & Chronicle, 5.24.04, 5.25.04). Thunderstorms on the 23rd and 24th, "delivered as much as 2 to 4 inches of rain over most of western New York. On the 24th, the National Weather Service issued two severe thunderstorm warnings for Monroe County within six hours' time. With the ground being saturated, any rainfall will create the potential for significant additional flooding" (Democrat & Chronicle, 5.25.04).
May 24, 2004	Thunderstorm Wind	N/A	N/A	In Webster, power lines were down, E55KT Durand-Eastman Park closed portions of the park due to standing water. Pine Brook Elementary School in Greece had the day off because a lightning strike cut power. Rochester firefighters pumped 72 basements. RG&E reported outages for 6,700 customers (Democrat & Chronicle, 5.25.04). The Rush Fire Department canceled their routine water rescue training because of unsafe conditions on Honeoye Creek. They were subsequently called to rescue four people who were rafting in the creek near the bridge on NYS Route 15A. One person was trapped in the creek. "Two of the rescuers and the person trapped were brought to shore by ropes" during the rescue (Democrat & Chronicle, 5.26.04).
July 20, 2004	Hail	N/A	N/A	Pittsford: 0.75 inches
August 29, 2004	Thunderstorm Wind	N/A	N/A	Henrietta Power Lines Down, E50KT; Brighton Large Tree Down, E50KT
June 13, 2005	Thunderstorm Wind	N/A	N/A	Mendon Trees Down, EG50KTS; Clarkson Trees/Limbs down, EG50KTS
July 14, 2005	Thunderstorm Wind	N/A	N/A	Rochester ASOS, MG56KTS; Rochester Tree limbs/chimney down, EG55KTS; Spencerport Wires and Trees down, EG50KTS Thunderstorms that ripped through parts of Monroe County, are to blame for power outages, localized flooding, at least one house fire and one minor incident of a person struck by lightning. The woman struck was shocked by lightning that traveled through the home's telephone line. The National Weather Service, Buffalo Office said strong storms blew through western Monroe County between 7:30 and 8:30 p.m. They reported indications of rainfall greater than 3 inches an hour, which is the whole monthly average rainfall in about an hour. The rain caused numerous flooded basements and some flooded roadways. The power outages affected about 5,700 RG&E customers" (Democrat & Chronicle, 7.15.05).





		FEMA Declaration	County	
Dates of Event	Event Type	Number	Designated?	Losses / Impacts
July 26, 2005	Thunderstorm Wind	N/A	N/A	Honeyoe Falls Trees Down, EG50KTS Violent Thunderstormstoppled trees and power lines in Honeoye Falls. Emergency Services and DPW crews cleared debris from roadways and attended occupants of a car who were trapped when a falling tree struck their vehicle. Local damage was reported on TV13 newscast the following morning" (The Sentinel, 8.4.05). "Peak gusts of 37 mph were recorded at the Airport. The winds downed tree limbs and power lines. A man was struck by lightning in his home when it traveled through electric wiring in his house" (Democrat & Chronicle, 7.27.05).
August 29-October 1, 2005	Hurricane Katrina Evacuation	EM-3262	Yes	Not listed.
September 29, 2005	Thunderstorm Wind	N/A	N/A	Brockport Trees/Wires down, EG50KTS The winds were strong enough to cause damage to trees, homes and scattered power outages to more than 5,600 RG&E customers. A wind gust of 45 mph was registered at the Rochester Airport. The strong winds accompanied by thunderstorms were leading a cold front into New York" (Democrat & Chronicle, 9.30.05, 10.2.05, The Sentinel, 10.6.05).
November 6, 2005	Thunderstorm Wind	N/A	N/A	Hamlin Wires Down, EG50KTS Supercell thunderstorms raced across the area at 60 mph. Supercells are capable of producing tornadoes, large hail, and dangerous bursts of wind or flash flooding, as well as significant lighteningThe separation between updraft and downdraft leads to longer storm life, helping the storm maintain itself for several hours. 4,000 RG&E customers lost power. Most of the problems were from tree limbs on power lines. The peak wind gust at the Airport was 47 mph" (Democrat & Chronicle, 11.8.05). "WHAM-TV13 was knocked off the air for about half an hour, until 6:35 p.m., by transmitter problems" (Democrat & Chronicle, 11.7.05).
November 9, 2005	Hail	N/A	N/A	Henrietta: 0.75 inches Heavy rains, lightening and hail tore through the Rochester area causing strange weather. Four people on the Wesleyan College Campus were treated for non-life-threatening injuries when lightning struck nearby. Multiple accidents, multiple alarm calls and some flooding the low areas were reported to the 911 Center. About 500 RG&E customers lost power (Democrat & Chronicle, 11.10.05).
February 17, 2006	High Wind	N/A	N/A	Greater Rochester International Airport (ROC) ASOS – MG67KT The area had an official wind gust of 77 mph; this is second on the all-time list" (Democrat & Chronicle, 2.12.09).





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
April 13, 2006	Hail	N/A	N/A	Greece: 1.00 inches
May 13, 2006	Hail	N/A	N/A	Rochester: 1.0 inches
June 28, 2006	Thunderstorm Wind	N/A	N/A	Webster Trees Down, Garage door blown in, EG53KT
June 28, 2006	Hail	N/A	N/A	Penfield: 1.5 inches; Henrietta: 1.50 inches
July 10, 2006	Thunderstorm Wind	N/A	N/A	Webster Trees down, on shed, EG52KT
July 29, 2006	Thunderstorm Wind	N/A	N/A	Lockport Trees down, EG50KT
August 2, 2006	Thunderstorm Wind	N/A	N/A	Hilton Power Lines down, EG50KT
October 29, 2006	High Winds	N/A	N/A	Winds ranged from 25 to 35 mph, with gusts above 40 mph coming off Lake Ontario. Drivers were warned to use caution on roadways and bridges. At its peak, more than 4,500 customers were without power. The NWS, Buffalo Office, issued a wind advisory until 6:00 p.m. There were no cancellations or delays at the Rochester Airport. The high winds caused tree branches to fall on homes and take down power lines" (Democrat & Chronicle, 10.30.06).
December 1, 2006	High Wind	N/A	N/A	ROC EG50KT The NWS, Buffalo Office, reported a wind gust of more than 40mph at the Airport. RG&E had about 3,600 customers without power. Several flights were cancelled at the Airport (Democrat & Chronicle, 12.2.06). The high winds produced a seiche on Lake Ontario. "Water is pushed from one end of the lake and piles-up on the opposite side. Seiches can cause changes in water level of several feet before diminishing over time" (Democrat & Chronicle, 12.3.06).





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 8, 2007	Thunderstorm Wind	N/A	N/A	Henrietta Trees/wires down, EG50KT Strong winds, frequent lightening and briefly heavy rain caused scattered power outages. Fallen tree limbs were reported throughout the area. A house was struck by lightning but no injuries were reported. About 8,000 RG&E customers lost power" (Democrat & Chronicle, 6.9.07).
June 19, 2007	Thunderstorm Wind	N/A	N/A	Rochester Trees down, 1 dead, 1 injured; Rochester Trees down, EG50KT; Brockport Trees/wires down, EG50KT A man on an ATV was killed near Riverside Cemetery when a treetop snapped and landed on him during a fast-moving heavy thunderstorm that brought wind gusts of more than 60 mph." In the city, a 500-pound street vendor cart was lifted by the wind and slammed into a car. The fire service responded to calls for people trapped in their cars from falling trees, and DPW crews responded to remove trees that blocked streets. Multiple reports of trees on houses, into houses and obstructing building access were received at the 911 Center. More than 11,500 RG&E customers lost power, and some traffic signals were dark as a result (Democrat & Chronicle, 6.20.07, 6.21.07).
June 21, 2007	Hail	N/A	N/A	Penfield: 1 inch; Honeoye Falls: 0.75 inches
August 16, 2007	Thunderstorm Wind	N/A	N/A	Scottsville Wires down, EG50KT
September 11, 2007	Thunderstorm Wind	N/A	N/A	Mendon Trees/Wires down; tree on home, EG55KT
January 9, 2008	High Wind	N/A	N/A	Brighton Trees Down, EG74MPH
January 9, 2008	Thunderstorm Wind	N/A	N/A	ROC ASOS MG75MPH The winds gusted to hurricane force at 75 mph, downing trees and causing power outages. This is the fourth-highest recorded gust in Rochester history (Democrat & Chronicle, 2.4.08, 2.16.08).
January 30, 2008	High Wind	N/A	N/A	ROC ASOS MG60MPH The peak wind speed was 63 mph, again downing trees and causing power outages (Democrat & Chronicle, 1.31.08, 2.4.08).





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
April 26, 2008	Hail	N/A	N/A	Rochester: 1 inch
June 5, 2008	Thunderstorm Wind	N/A	N/A	Rochester Roof blown off building, EG50KT
June 10, 2008	Hail	N/A	N/A	Honeoye Falls: 0.75 inches
June 10, 2008	Thunderstorm Wind	N/A	N/A	Pittsford Trees and wires down, EG50KT
June 13, 2008	Thunderstorm Wind	N/A	N/A	Greece Wires down, EG50KT
June 16, 2008	Hail	N/A	N/A	Chili Center: 0.88 inches; 3S Penfield: 0.75 inches; Fairport: 0.75 inches; 2SE Fairport: 0.88 inches; Fairport: 0.75 inches; 3S Fairport; 0.75 inches; 2S Brockport: 0.75 inches
June 29, 2008	Thunderstorm Wind	N/A	N/A	Hamlin Trees down, EG50KT
July 16, 2008	Hail	N/A	N/A	Brockport: 0.75 inch
July 23, 2008	Hail	N/A	N/A	Henrietta: 1 inch
July 23, 2008	Thunderstorm Wind	N/A	N/A	1NW Honeoye Falls Trees down, EG50KT; Gates Trees down, EG50KT
February 12, 2009	High Wind	N/A	N/A	Brighton EG60MPH
June 2009	Thunderstorm Wind, Hail	N/A	N/A	The last week of June featured thunderstorms that produced localized flooding and damaging hail, which was reported up to 1.75 inches in diameter" (Democrat & Chronicle, 7.2.09).





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 26, 2009	Hail	N/A	N/A	Greece: 1 inch; N. Brockport 0.75 inches; 5SW Brockport: 1.5 inches; Brockport: 0.75 inches; Rochester: 1 inch
July 25, 2009	Tornado	N/A	N/A	Hilton F0 1755-1805
July 25, 2009	Thunderstorm Wind	N/A	N/A	Brockport Trees/wires down; Churchville Trees/wires down; West Webster Tree on house; Irondequoit – Power transformers down; Rochester – Trees down in city
July 26, 2009	Thunderstorm Wind	N/A	N/A	Rochester –Lyell Road Trees down
August 22, 2009	Hail	N/A	N/A	2W Spencerport: 0.75 inches
September 28, 2009	Thunderstorm Wind	N/A	N/A	Brockport Trees/wires down; Hilton Trees/wires Railroad/Underwood; 4NW Rochester Trees down West Ridge Rd
May 8, 2010	High Wind	N/A	N/A	Deep low pressure passed over western New York with its trailing cold front rapidly sweeping east across the region. Winds increased within a few hours of the approaching front to gust speeds of 60 to 65 mph. Tens of thousands were left without power. There were reports of vehicles and/or buildings damaged by falling trees in: Niagara Falls, Ransomville, Rochester, Olean, and Perry just to name a few. The high winds were blamed for several delayed flights at both Buffalo and Rochester airports. "14,000 customers lost power due to winds that took down trees and power lines." Two- tenths of an inch of snow fell in Charlotte and a trace was measured at the Airport on Sunday morning (Mother's Day). A freeze warning was in effect the morning of May 10th as the cold front that brought the high winds made its way across the region (Democrat & Chronicle, 5.8.10, 5.10.10).





	î.		ũ.	
Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
July 21, 2010	Thunderstorm Wind	N/A	N/A	Thunderstorms developed ahead of an approaching cold front. The thunderstorms produced large hail and damaging winds. Hail up to an inch and three-quarters was reported in Ontario, Wayne and Jefferson counties. The thunderstorm winds downed trees and power lines in the City of Rochester and Town of Brighton. Utility companies reported thousands without power. Just before 1:00 p.m., a Thunderstorm produced downpours, quarter-sized hail and damaging winds up to 60 MPH in Monroe County. About 3,000 RG&E customers, including Highland Hospital were without power for hours. Wind also knocked down trees, branches and power lines. Worst hit were Perinton, Pittsford, Chili, Henrietta, Rochester, and Irondequoit. NWS Buffalo reported a total of 1.88 inches of rain fell at the Airport by 5:00 p.m., breaking the record of 1.77 inches for the day set in 1919" (Democrat & Chronicle, 7.22.10). The National Weather Service, Buffalo Office issued a Severe Thunderstorm Warning and a Flood Warning in Monroe County related to this storm (NWS Bulletins, 7.21.10).
August 19, 2010	Thunderstorm Wind	N/A	N/A	Thunderstorms developed ahead of an approaching cold front during the late afternoon hours. In Monroe County, the thunderstorms produced strong winds that downed trees and power lines. At the Long Pond Shores apartment complex in Greece, a large tree fell on part of the building. Fallen limbs were scattered along Lakeshore Road in Irondequoit. Electric Utilities reported about 150 homes without power in Irondequoit and Webster.
September 13, 2010	Hail	N/A	N/A	A cold front crossed western New York during the early afternoon hours. Thunderstorms which accompanied the front produced hail up to one inch in diameter near Brighton and Greece.
April 28, 2011	High Wind	DR-1993	No	Following the passage of a strong cold front, strong synoptic winds developed across western New York. The strong winds downed trees and power lines. Specific measured wind gusts included 62 mph at Rochester Airport.
May 29, 2011	Thunderstorm Wind	N/A	N/A	A slow moving cold front crossed the region during the late evening and early overnight hours. The thunderstorms produced wind gusts measured to 65 mph. Numerous localities across the region report trees and power lines downed.
August 13, 2011	Thunderstorms and Hail	N/A	N/A	Thunderstorms that moved across the area produced winds gusting to 60 mph. The winds downed trees and power lines in Ontario and Marion (Wayne County) and in the Village of Fairport (Monroe County). Hail up to three quarter inch in diameter fell in Greece, Monroe County.
August 28, 2011	Hurricane Irene	EM-3328 / DR- 4020	Yes / No	Hurricane Irene tracked northeast along the Atlantic Coast and brought gusty winds to the eastern sections of the area. Measured winds gusted to 40 to 45 mph. Normally winds of this magnitude are not strong enough to cause damage however the ground was west and the north to northeast flow opposite of the prevailing direction for the region. Trees are anchored for the prevailing direction and are susceptible to even marginally strong winds from the opposite direction. Downed trees and lines were reported in the Town of Greece and the City of Rochester. Utilities reported several thousand customers without power.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
January 17, 2012	Thunderstorm Wind	N/A	N/A	Low pressure moved across southern Ontario and pulled a strong cold front across the region during the evening hours. Thunderstorms which accompanied the front produced wind gusts up to around 70 mph. The strong winds downed trees and power lines and poles. Power outages were scattered throughout the region with utilities reporting several thousand without power at its worse.
January 17, 2012	High Wind	N/A	N/A	Strong winds developed across the entire area in the wake of a strong cold front and associated with a deep low pressure center that moved across southern Ontario. Winds gusts to around 70 mph and remained quite strong all night. The strongest winds occurred along the Lake Erie shoreline to the Chautauqua Ridge and the Lake Ontario shoreline from Henderson Bay to the St. Lawrence River. Throughout the region, the strong winds downed trees and power lines. Several autos were reported damaged by falling trees. Several reports of downed signs and minor structure damage were also received. Some school districts in the area either cancelled classes or delayed start as a result of wind damage. Utilities reported tens of thousands without power at the peak of the storm. Specific gusts included: 72 mph at Rochester.
February 24, 2012	High Wind	N/A	N/A	Low pressure over the Ohio Valley deepened as it lifted northeast across the Great Lakes then down the St. Lawrence Valley. The low brought strong winds to the region. Trees and power lines were downed. Scattered power outages were reported. Measured gusts included: 53 mph at Rochester Airport.
March 3, 2012	High Wind	N/A	N/A	Deep low pressure moved from the Midwest across Lake Huron into Quebec. Southeast winds gusting to 55 mph quickly shifted to southwest and increased to 30 to 40 mph with gusts nearing 70 mph. The strong winds downed trees and power lines. A few autos were reported damaged by falling trees. Several reports of downed signs and structural damage to roofs and awnings were also received. Some school districts in the area either cancelled classes or delayed start as a result of wind damage. Utilities reported several tens of thousands without power at the peak of the storm. Specific gusts included 66 mph at Rochester Airport and 59 mph at Irondequoit.
May 29, 2012	Hail	N/A	N/A	A strong cold front crossed the region bringing an end to oppressive heat and humidity. The front however was accompanied by severe thunderstorms which produced hail up to one- and-three-quarter inches in diameter and damaging winds that downed trees and power lines. Utilities reported tens of thousands without power scattered throughout the region. Only minor structural damage was reported, mainly broken windows and ripped off shingles. Several automobiles were damaged by falling trees and limbs.
July 31, 2012	Thunderstorm Wind	N/A	N/A	While a slow moving cold front eased south across southern Ontario, a 30-mile wide band of showers and thunderstorms developed over Western New York. Initially the thunderstorms produced heavy rains. The thunderstorms continued to strengthen as they moved into the southern tier and eastern Lake Ontario Region. Reports of downed trees and wires were scattered throughout the region. Falling trees damaged homes in Savannah and Fairport. Hail, up to three-quarter inch in diameter, was reported with the storms.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
August 5, 2012	Thunderstorm Wind	N/A	N/A	Showers and thunderstorms developed in a warm, moist atmosphere ahead of an approaching cold front. Wind gusts were measured to 60 mph. The thunderstorm winds downed trees and power lines throughout the region. In many areas, downed trees blocked roads and highways.
September 7, 2012	Thunderstorm Wind	N/A	N/A	Thunderstorms developed in unseasonably warm and muggy conditions across the Genesee Valley, away from the stabilizing effects of the Great Lakes. The thunderstorm winds downed trees and power lines in the Towns of Brighton and Webster.
October 29, 2012	High Wind	EM-3351	Yes	Remnants of Hurricane Sandy brought strong winds and heavy rains to western and north central New York. Rainfall amounts of two to five inches were measured across the area with some area creeks reaching the top of banks. The high winds downed trees and power lines throughout the region. Wind gusts were measured to 60 mph. Tree damage was greater than usual with such wind speeds because of saturated ground and northeast winds - opposite of the normal prevailing southwest direction. Utilities reported tens of thousands of customers without power across the entire region. Specific measured gusts included: 60 mph at Irondequoit Bay. In addition to the remnants of Superstorm Sandy (i.e., high winds and heavy rains) causing road closures and power outages across the County, the hurricane also activated the County's mutual aid agreement. Monroe County provided almost 45 firefighters to assist the cleanup and recovery efforts following Superstorm Sandy. Firefighters hailed from nearly a dozen fire departments, including Gates, Brighton, Spencerport, West Webster, and Fairport (Cleare 2012). Monroe County reported costs of \$127,375.03, and non-county costs of \$755,799.35.
January 20, 2013	High Wind	N/A	N/A	A deepening storm system moved across the Upper Great lakes. The system brought strong, damaging winds to the entire region late Saturday night into Sunday (20th-21st). Trees, power poles and wires were brought down by the winds. Numerous roads were blocked by fallen trees, wires and debris. Some structural damage was also reported. Utilities reported tens of thousands without power for a time. Specific measured gusts included 59 mph at the Rochester Airport.
January 31, 2013	High Wind	N/A	N/A	Low pressure moved across the lower Great Lakes bringing a strong cold front across the region. In the wake of the front, strong westerly winds overspread the area. The wind downed trees and power lines. Utilities reported scattered outages across the region. Specific wind gusts recorded included 59 mph at the Rochester Airport.
May 15, 2013	Hail	N/A	N/A	An isolated thunderstorm moved on-shore from Lake Ontario and crossed Orleans and Monroe counties. The thunderstorm produced hail which reached 1 inch in diameter near Albion. At peak, the hail covered the ground.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
May 21, 2013	Hail	N/A	N/A	Thunderstorms developed along various boundaries within a warm and moist air mass over the region. Storms first developed across the Finger Lakes midday along the Lake Ontario lake breeze and then in the midafternoon along the Lake Erie lake breeze boundary as it pushed inland across the Southern Tier. The strongest storms produced 1- to 2-inch hailstones. Specific hail reports were received from Stanley, Geneva, Newark, Walworth, Marion, and Brockport. In several of those locations, automobiles were damaged by the hail stones.
June 1, 2013	Thunderstorm Wind	N/A	N/A	Two distinct lines of thunderstorms developed ahead of a weak boundary during the late afternoon and became more organized toward evening. One line developed across the Genesee Valley and the other across the eastern Lake Ontario Region. In some areas, scattered power outages were reported as the falling limbs and trees brought down power lines. In Rochester, lighting struck a house igniting a fire and damaging the chimney.
June 1, 2013	Lightning	N/A	N/A	Law enforcement reported that house was damaged by a lightning strike. This event is associated with the thunderstorm event on the same day.
June 17, 2013	Hail	N/A	N/A	A weak cold front crossing the region was accompanied by showers and thunderstorms. The thunderstorms produced hail up to 3/4 inch in diameter.
July 3, 2013	Thunderstorms and Hail	DR-4129	No	Thunderstorms developed over the northern Finger Lakes along a lake breeze in a warm humid air mass. The thunderstorms produce damaging winds which downed trees and power lines in Fairport and Pittsford. Between one-and-one-half and two-and-one half inches of rain was measured across parts of Monroe and Wayne Counties. This amount of rain in a very short time resulted in flooding in the City of Rochester. Several city streets were inundated, included Amsterdam Road and Monroe Avenue. Monroe County OEM had costs related to food (for EOC representatives - \$2,575.29) and water (for shelters - \$596.38) for a total of \$3,171.67.
July 18, 2013	Thunderstorm Wind	N/A	N/A	Scattered thunderstorms developed during the afternoon hours. An isolated thunderstorm over Monroe County produced damaging winds which downed trees and power lines in the Town of Greece.
July 19, 2013	Tornado	N/A	N/A	A thunderstorm moving across Lake Ontario spawned a waterspout just north of Hilton, New York. The waterspout, caught on amateur video, came onshore and moved across a small section of Braddock Point before moving back out over water in Braddock Bay. Onshore, the tornado downed several large trees. A home on Ontario Boulevard and several automobiles were damaged by the falling trees. The overall path length was approximated at less than a mile however the exact location of formation and dissipation over the water was unknown. Over land, the tornado path length was about a quarter of a mile, width was about ten yards, and it was ranked an EF0. Winds were estimated at 65 mph.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
August 2, 2013	Hail	N/A	N/A	Showers and thunderstorms accompanied the passage of a short wave trough across the area. The thunderstorms produced hail up to one-inch in diameter. Hail was reported in Kent, Greece, and Clarence.
November 1, 2013	High Wind	N/A	N/A	Deep low pressure lifted across the Great Lakes region. The system brought strong winds to much of the region on Friday, November 1st. Winds gusted as high as 62 mph. The strong winds downed trees and power lines throughout the region. Power outages were in the tens of thousands. In addition to minor structural damage to homes and building, a number of houses and automobiles were damaged by falling trees and limbs. Reports of damage were received from Rochester. Specific measured wind gusts included 56 mph at Rochester Airport.
November 18, 2013	High Wind	N/A	N/A	Rapidly deepening low pressure tracked from the Upper Great Lakes to James Bay and brought strong winds to the entire region. The winds, gusting as high as 68 mph, brought down trees and power lines throughout the region with numerous reports of damage from downed trees. Power outages were in the tens of thousands. Specific measure wind gusts included 63 mph at Rochester Airport.
January 6, 2014	High Wind	N/A	N/A	A sharp cold front crossed the region during the overnight/early morning hours. For a brief period in the wake of the front winds increased across the region. The winds gusted as high as 60 miles per hour. Downed trees and power lines were reported from Chili Center.
May 3, 2014	Hail	N/A	N/A	A thunderstorm crossing Monroe County produced 3/4 inch hail in Rochester and Irondequoit.
June 17, 2014	Thunderstorm Wind	N/A	N/A	Scattered showers and thunderstorms developed in a warm, humid air mass during the afternoon hours. These were followed by a large area of showers and thunderstorms associated with low pressure moving across the Great Lakes into southern Ontario and then Quebec. Several of the thunderstorms produced strong, damaging winds. Damage was mainly reported as downed trees and wires however there were some reports of structural and other damage. The thunderstorms also produced hail up to 1-1/4 inch.
August 1, 2014	Hail	N/A	N/A	Thunderstorms developed in a moderately unstable air mass along the lake breeze boundary that extended across the lower Genesee Valley and Western Finger Lakes. The thunderstorms produced damaging winds that downed trees and wires in Greece and Newark. Also, 1 -inch hail was reported in Rochester and 3/4inch hail covered the ground in Newark. The heavy rains that fell resulted in urban flooding. Storm sewers were not able to keep up in the intense rainfall with streets closed in Newark and Greece.
August 1, 2014	Thunderstorm Wind	N/A	N/A	This event is associated with the hail event on the same day. Associated damage listed above.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
January 4, 2015	High Wind	N/A	N/A	Deepening low pressure tracked from western Lake Erie across far southern Ontario to Quebec dragging a cold front across the region. Strong winds increased to near 60 mph about 2 to 3 hours after the cold front passage. The strong winds downed trees and wires across western New York. Scattered power outages resulted. Some specific damage locations included St. Paul Boulevard in the Town of Irondequoit.
Note:Monetal the pressASOSAutomaEEastEGEstimateFAAFederalKT/KTSKnot(s)mphmiles pe	ent day, monetary losse ted Surface Observing S ed Gusts Aviation Administratio r hour Rochester Internationa	ble were U.S. Dolla s would be conside System n	ur (USD) figures ca	lculated during or within the approximate time of the event. If such an event would occur in Ds as a result of inflation.



H.1.5 Infestation and Invasive Species

Known infestation and invasive species events that occurred from 1950 to 2015 are identified in Table H.5. With infestation and invasive species documentation for New York State and Monroe County being so extensive, not all sources have been identified or researched. Therefore, Table H.5 may not include all events that have occurred in the County.





Table H.5. Infestation and Invasive Species Events in Monroe County, 1950 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
1950s-1960s	Dutch Elm	N/A	No	Dutch Elm Disease destroyed a multi-state region of elms in the 1950s through the 1960s.
2010	Stink Bug	N/A	No	Populations of the brown marmorated stink bug caused catastrophic damage to most mid-Atlantic states in 2010, including New York State. Losses in Monroe County to the green pea and sweet corn crops totaled \$46,288 in 2010.
2010-2013	Emerald Ash Borers	N/A	No	 Emerald ash borers (EAB) were first found in North America in 2002 and have been blamed for killing tens of millions of ash trees in 15 states and two Canadian provinces. The tiny green beetles from Asia were first identified in New York in 2009. In 2013, EAB colonies had populated large swaths of ash trees in Monroe County within the municipalities of the Towns of Chili, Henrietta, and Rush, and the Village of Scottsville, and had entered adjoining sections of the Town of Brighton and City of Rochester. As of August 3, 2015, Monroe County remained under both state and federal quarantines due to EAB infestations. All Monroe County municipalities were included in the 2015 New York State EAB Quarantine Boundary Severe Risk Area as of April, 2015. Precise damage estimates from infestation are difficult to quantify, though municipal costs of clearing dead trees and downed power lines from dead limbs are expected to climb in infested areas. Further, severe loss of ash in riverine communities may lead to bank erosion, sedimentation, flooding caused by debris in waterways, and less groundwater absorption
2012	Armyworm	N/A	No	A spring storm system brought adult armyworm moths to western New York (from the south). The early arrival of warm spring weather was blamed for the appearance of an unusually high number of army worms. Ordinarily, they arrive later in the season, when more of their natural predators are present. Monroe County was included in a USDA disaster declaration (S3411) for the armyworm outbreak.
2010 to 2015	West Nile Virus	N/A	No	 Between 2010 and 2015, Monroe County had a very low occurrence of WNV among birds, horses, humans, and pets. 2013 – 2 human cases, 1 equine 2012 – 2 human cases 2011 – 0 cases reported 2010 - 0 cases reported

USGS 2014; USDA 2015; NYSDOH 2015; CDC 2015 Source:

CDC Centers for Disease Control

EAB Emerald Ash Borer

FEMA Federal Emergency Management Agency

N/A USDA Not applicable

U.S. Department of Agriculture







WNV West Nile Virus





H.1.6 Severe Winter Storm

Known severe winter storm events that occurred in Monroe County between 1990 and 2015 are identified in Table H.6. With severe winter storm documentation for New York State and Monroe County being so extensive, not all sources have been identified or researched. Therefore, Table H.6 may not include all events that have occurred in the County.





 Table H.6. Winter Storm Events Between 1990 and 2015.

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
February 1, 2008	Winter Storm	N/A	No	Initially a snow storm, then a mix of snow, freezing rain and sleet, spread across parts of the region. Snowfalls in Monroe County ranged from 5 to 11 inches, followed by 1 to 2 inches of sleet or ice. Property damage from the storm was estimated at \$10,000 in Monroe County.
February 10, 2008	Winter Weather	N/A	No	An arctic front roared across the eastern lakes region on Sunday morning, February 10. Snow squalls accompanied the front, which was trailed by strong northwest winds. The strong winds blew about the freshly-fallen snow producing whiteout conditions and blowing snow on Interstate 390 in the Town of Gates. A 36-car accident occurred in which a 17-year old girl died, and nearly two dozen others taken to the hospital. Property damage from the storm was estimated at \$500,000 in Monroe County.
March 4, 2008	Winter Storm	N/A	No	Low pressure developed over the lower Mississippi valley and lifted to the Ohio valley. The storm brought a mix of snow, sleet, and freezing rain to the region. About 4 to 6 inches blanketed the entire region and was followed by several inches of sleet and up to ½ inch of glaze from freezing rain. Schools were closed in many parts of the region. Some county officials declared a States of Emergency, while others recommended no unnecessary travel. Utility companies reported scattered power outages affected tens of thousands of customers across the region. Property damage from the storm was estimated at \$10,000 in Monroe County.
March 7-9, 2008	Winter Storm	N/A	No	One of the worst storms of the 2007-2008 winter season occurred from March 7 through March 9. This was an extended two-part event, but totals of 1 to 2 feet of snow were common, with some isolated higher amounts. The storm occurred over a weekend so impact to daily activities (school and businesses) was minimal. Numerous automobile accidents were blamed on the slippery conditions and poor visibilities in falling and blowing snow. The storm dropped about 16 inches of snow on Rochester during a 36-hour period. RG&E reported 3,300 customers without power. Blowing and drifting snow caused whiteout conditions on roads and visibility at the Rochester Airport was 0.8 mile. Thunder and lightning accompanied bands of heavy snow the afternoon and evening of March 8 [.] Snowfall reports in Monroe County included 22 inches in the Town of Hamlin; 14 inches in the Town of Webster; and 13 inches in the Town of Greece. Property damage from the storm was estimated at \$25,000 in Monroe County.
December 19, 2008	Winter Storm	N/A	No	Low pressure moved out of the central plains and moved across Pennsylvania. The low brought an 8- to 12-inch blanket of snow to the entire region on December 19. Across the western southern tier, snowfall amounts were slightly lower; the snow mixed with freezing rain and sleet across that area. Some of the highest snowfall amounts included 11 inches in the Town of Perinton, 9 inches at





				· · · · · · · · · · · · · · · · · · ·
Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				the Rochester Airport, and 10 inches in the City of Rochester. Innumerable automobile accidents were reported throughout the region as the roads became hard to navigate in the heavy snow and reduced visibilities. Schools shut down across the region and many municipalities suggested avoiding unnecessary travel if possible. Property damage from the storm was estimated at \$20,000 in Monroe County.
December 31, 2008	Winter Storm	N/A	No	A deepening area of low pressure moved across the Ohio valley and Pennsylvania before moving off the southern New England Coast during the afternoon of December 31. Steady snow developed over the region and was accompanied by increasing northerly winds. Widespread snowfall amounts ranged from 8 to 14 inches during the 8-hour event. The strong winds produced areas of blowing and drifting snow and resulted in significantly reduced visibilities. Some of the highest snowfall reports included 9 inches in the Town of Greece and 8.9 inches at the Rochester Airport. Property damage from the storm was estimated at \$10,000 in Monroe County.
December 10-12, 2009	Lake Effect Snow	N/A	No	Lake-effect snows developed off Lakes Erie and Ontario in a well-aligned, cold, unstable west to southwest flow. Strong winds allowed the snow bands to extend well inland, but produced significantly reduced visibilities in blowing and drifting snow. The Lake Erie snows produced significant accumulations well into the Rochester metro area. Off Lake Erie, the event began across northern Erie and southern Niagara counties, and then settled south into southern Erie and Wyoming counties by mid-morning Thursday (December 10) after dropping 2 to 4 inches. The storm then moved northward for several hours across the metro Buffalo area and across Genesee and Monroe counties, then settled slowly south and stalled out for many hours during the evening with very intense snowfall rates across the Buffalo south towns and Wyoming county. Areas immediately adjacent to the east shores of the lakes received up to 40 inches. An unusual wind shift above Lake Erie blew blizzard-like conditions into the Rochester area on December 10th, slowing the evening commute, and causing dozens of accidents. Specific snowfall amounts included 3 to 9 inches in the City of Rochester (from north to south). Property damage from the storm was estimated at \$15,000 in Monroe County.
January 1, 2010	Lake Effect Snow	N/A	No	A strong cold front crossed the region on New Year's Day. A broad area of lake- effect snows develop along the south shores of Lakes Erie and Ontario late on the first, and impacted up to 20 miles inland. The activity continued through Saturday (January 3) and then strengthened in place Saturday night as a large area of moisture spiraled around a massive coastal storm off New England. About 12 to 24 inches fell over two days, with up to 18 inches in the Rochester area. Nine to 18 inches fell in Rochester (from north to south across the city). Property damage from the storm was estimated at \$20,000 in Monroe County.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
January 3-9, 2010	Winter Storm	N/A	No	Rochester Airport recorded 116 straight hours of snow, with an accumulation of 12.3 inches.
February 25-26, 2010	Winter Storm	N/A	No	A deep storm system off Long Island strengthened and stalled off the New York/New Jersey coast. The system circulated Atlantic moisture back across western and north central New York. About 6 to 10 inches of snow fell across the region with higher amounts to the east (closer to the low center) and downwind of the Great Lakes (where lake enhancement occurred). Rochester received 10 to 16 inches. Many schools throughout the region were closed because of the snow. Numerous automobile accidents were blamed on the treacherous driving conditions. RG&E restored power to 1,311 customers in an hour when heavy snow dropped tree branches on a power line in Webster. Reported storm totals included: 22 inches in the Towns of Webster and Hamlin. Property damage from the storm was estimated at \$20,000 in Monroe County.
December 5, 2010	Lake-Effect Snow	N/A	No	A strong northwest flow of arctic air produced long lasting lake-effect snow squalls to the southeast of Lakes Erie and Ontario. The event began on December 5 with strong bands off Lakes Huron and Ontario. The Ontario band worked across the Rochester area during the afternoon and then slowly settled south overnight, and combined with a Georgian Bay band to drop 4 to 8 inches around the City of Buffalo on Monday, December 6. This activity broke down later Monday but strong bands set up Monday night and continued through Wednesday night in an area from the City of Rochester to the City of Syracuse. Off Lake Ontario, reported snow totals included 24 inches in the City of Rochester. Property damage from the storm was estimated at \$10,000 in Monroe County.
December 13-14, 2010	Lake-Effect Snow	N/A	No	The fourth lake-effect event of the winter season followed on the heels of storm which brought a cold rain to most of the area. The event was long lasting and featured three sub-events. Most of the accumulation occurred during these three sub-event periods, the first of which was a north to northwest upslope flow from late December 13 through the morning of December 14, which brought 6 to 10 inches from Monroe to Wayne Counties and over 12 inches of snow in the Chautauqua ridge. The storm continued across the Niagara frontier during afternoon December 14 and then dropped 12 inches of snow over Oswego county Wednesday night to Thursday morning the 15th-16th. Lighter activity continued outside of these periods but accumulating snow fell at least until Friday. The 4- day totals topped more than 12 inches across the greater Rochester area. Reported totals included 18 inches in the City of Rochester. Property damage from the storm was estimated at \$25,000 in Monroe County.
February 25, 2011	Winter Storm	N/A	No	An intensifying area of low pressure moved across Pennsylvania then headed northeast across New England. The system brought a significant snowfall of 6 to 12 inches of snow to the entire area. A brisk northerly flow also resulted in a significant amount of blowing and drifting snow. Winds gusted to 40 mph along





		FEMA		
Dates of Event	Event Type	Declaration Number	County Designated?	Losses / Impacts
				the Lake Erie Shore. A 30-mile stretch of the New York State Thruway was closed because of multiple accidents. There were several reports of building collapses throughout the region from the weight of the snow that had built up throughout the snowy winter. Property damage from the storm was estimated at \$15,000 in Monroe County.
February 12, 2012	Lake-Effect Snow	N/A	No	While this event proved to have minimal impact on the Rochester metropolitan area because it occurred over a weekend, it was the first significant lake-effect snowstorm of 12 inches or more for the major urban area in several years. A low pressure system situated over the southern half of Quebec brought cold, northwest winds to the region. Lake-effect snow developed off Georgian Bay into a band that gathered additional moisture off Lake Ontario as it curved more to the east across Monroe County. Moderate to heavy lake effect snow then fell across a large portion of Monroe County during the early morning hours of Sunday, February 12, with accumulations of 12 inches or more experienced by daybreak. Specific reported snowfall totals included: 12 inches in the City of Rochester and the Town of Greece. Property damage from the storm was estimated at \$15,000 in Monroe County.
December 26, 2012	Winter Storm	N/A	No	Low pressure over the deep south lifted across the Tennessee Valley to the Delmarva coast. The low pressure spread about 12 to 18 inches of snow across the entire region. Winds increased to 20 to 30 mph, gusting at times to near 40 mph. The winds produced blowing snow and reduced visibilities. Numerous automobile accidents occurred because of the wintry conditions. Some holiday travel was disrupted at Buffalo and Rochester airports. Specific snowfall reports received included: 14 inches in the Town of Greece; 12 inches in the Town of Chili; and 11 inches at Rochester Airport. Property damage from the storm was estimated at \$15,000 in Monroe County.
January 22, 2013	Lake-Effect Snow	N/A	No	Lake snows persisted as a deep trough of low pressure became entrenched across the northeast United States. Off Lake Ontario, an intense band of lake-effect snow developed east of the lake late Monday Night and drifted slowly south across Oswego County on Tuesday producing more heavy snow along the way. Snowfall rates reached 3 to 5 inches per hour during this time. The band then settled along the south shore of the lake Tuesday Night with heavy snow along the entire south shore. Periodic bands of somewhat weaker lake effect snow then continued along the south shore of the lake through midweek. Specific snowfall reports included 11 inches at Hamlin Beach in the Town of Hamlin. Property damage from the storm was estimated at \$10,000 in Monroe County.
November 26, 2013	Winter Storm	N/A	No	A strengthening area of low pressure moved north along the U.S. East Coast. The storm brought accumulating snow across western New York. Across parts of the North Country, the snow mixed with sleet and freezing rain. Although not exceptionally high snowfall totals, strong winds accompanying the system resulted in a considerable amount of blowing snow resulting in frequent white out





		EEN/A		
Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				conditions. Several counties issued travel advisories because of hazardous road conditions. The fact that the storm occurred close to Thanksgiving added to the impact of the storm. Specific snowfall reports included 7 inches in the Town of Greece. Property damage from the storm was estimated at \$20,000 in Monroe County.
December 14, 2013	Winter Storm	N/A	No	Low pressure moved from the Ohio Valley to the East Coast and brought a general accumulating snow to much of the region. 6 to 10 inches of snow blanketed the region with the higher amounts across the higher elevations of the Eastern Lake Ontario region and areas south of Lake Ontario where lake enhancement occurred. The snow resulted in the usual traffic slowdowns and several accidents were blamed on the storm. Specific snowfall amounts that were reported included 7 inches in the City of Rochester.
December 21, 2013	Ice Storm	N/A	No	A surface front stalled across the region acted as a pathway for periods of heavy precipitation. To the north of the front, the precipitation fell as freezing rain. Ice coated trees, power lines and all exposed surfaces. Across the Niagara Frontier, ice accumulations of a half- to one-inch were reported. Across the north country, where the freezing rain persisted the longest, the ice accumulations ranged from one to two inches. The weight of the heavy ice brought down trees and power lines. Tens of thousands were left without power. In some cases, trees fell on homes, buildings and automobiles. At the RIT campus in the Town of Henrietta, cold temperatures and winds caused several pipes to burst in three apartment complexes. Total property damage on campus was \$67,000. Other property damage from the storm in Monroe County was estimated at \$50,000.
March 12, 2014	Blizzard	N/A	No	Low pressure moved across the Ohio Valley to the Mid-Atlantic coast then lifted northeast to the Canadian Maritimes. Snow began across the region during the pre-dawn hours of March 12. By morning, the combination of heavy snow and strong winds produced blizzard conditions across much of the region. Damage was mainly limited to economic loss of business and cost of cleanup as most businesses and schools announced closings early in the well forecast storm. The blizzard conditions led to cancellation of classes at the Rochester Institute of Technology (RIT) and closure of the university, and a power failure led to loss of service at a primary University data center, resulting in hardware and equipment damage. Sustained winds of 25 to 35 mph were accompanied by frequent gusts of 45 to 50 mph. Reported snowfall amounts included 19 inches at Hamlin Beach in the Town of Hamlin, 16.2 inches at Rochester Airport, and 14 inches in the Town of East Rochester. Property damage from the storm was estimated at \$42,000 in Monroe County, and Monroe County OEM had costs of \$628.93 related to food for EOC representatives.
March 29, 2014	Winter Storm	N/A	No	Low pressure moved across the Tennessee Valley to the Atlantic and then northeast along the coast. Precipitation began as rain across the region then changed to a brief period of freezing rain before changing to all snow. A blanket





		EEM A		
Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				of four to seven inches of snow covered the entire region. Snowfall accumulations were greater across the higher elevations and downwind of Lakes Erie and Ontario. Specific snowfall amounts included 10 inches in the City of Rochester and 9 inches at Rochester Airport. Property damage from the storm was estimated at \$20,000 in Monroe County.
December 10, 2014	Winter Storm / Nor'Easter	N/A	No	Low pressure developed off the mid-Atlantic coast then lifted to southern New England. The Nor'Easter brought a blanket of heavy snow to much of the region. The highest amounts were in Cayuga, Jefferson, Oswego, Wayne, Monroe, and Ontario Counties where a band of moderate to heavy snow fell on December 10 in the afternoon, and then another snow in the evening. The snow resulted in travel disruptions. Several school districts in the hardest hit areas were forced to close. Specific snowfall amounts received included 14 inches in the Town of Webster and 11 inches at Rochester Airport. Property damage from the storm was estimated at \$40,000 in Monroe County.
November 17-26, 2014	Severe Winter Storm, Snowstorm, and Flooding	DR-4204	No	Snowfall amounts of up to 4 feet impacted parts of Southern Erie County and Wyoming County on November 19th. The moderate to heavy snow extended east across Livingston and Ontario counties as well with accumulations approaching a foot over northern Livingston County. Millions of dollars were lost as area dairy farmers were unable to transport milk for processing. This event combined with the lake effect snow event following the next couple of days qualified the area for a Federal Disaster Declaration. Monroe County sent resources to Erie County to assist in the response to this storm. Assets were sent from County DOT, County Parks, County DES, County OEM, and County Fire Bureau. Costs incurred by Monroe County totaled \$28,304.81.
February 1, 2015	Winter Storm	N/A	No	Low pressure tracked across Ohio and Pennsylvania and brought a general 8 to 14 inches of snow to the entire region. Heaviest amounts were along the southern tier counties and over the counties along the south shore of Lake Ontario. Northeast winds became quite strong near Lake Ontario with near blizzard conditions occurring closer to the shore. While the snow did not result in many closings, the general snow across the entire region did result in many delays and late openings. Specific snowfall reports included 17 inches in the Town of Webster and 16 inches in the Town of Greece.
February 8, 2015	Winter Storm	N/A	No	Low pressure moved across Ohio and Pennsylvania to the Virginia Coast. The system brought a light general snowfall to the area. The northerly flow crossing the warmer waters of Lake Ontario and higher elevations resulted in enhanced snowfall amounts across parts of the Genesee Valley and northern Finger Lakes. Given the harsh winter conditions, the effects of this storm on the region were generally minimal with just some delays and longer travel times. Specific snowfall reports included 14 inches near Rochester.





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
February 14, 2015	Winter Storm	N/A	No	A strong clipper crossed the Great Lakes and brought snow and blowing snow to the region and some of the coldest air of the season. The snowfall amounts were enhanced downwind of Lake Ontario and upslope east of Lake Erie where snowfall amounts around a foot were recorded. Gusty winds accompanied the system and produced reduced visibilities in blowing snow. On the back side of the system, temperatures plummeted and struggled to reach zero on February 15. Combined with the winds, wind chill temperatures of 25 to 35 degrees below zero were recorded.

Sources: NOAA-NCDC 2015; FEMA 2015

FEMA Federal Emergency Management Agency

NCDC National Climatic Data Center

NOAA National Oceanic and Atmospheric Administration

RG&E Rochester Gas and Electric

RIT Rochester Institute of Technology



H.1.7 Wildfire

Known wildfire events that have impacted Monroe County from 1994 to 2015 are identified in Table H.7. Fire departments throughout the County respond to small brush fires each year. However, many of these fires are so small that little information is available. Therefore, Table H.7 may not include a complete record of all wildfire events that have occurred within the county.





Table H.7. Wildfire Events in Monroe County, 1994 to 2015

Date(s) of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
October 16, 1994	Fire	N/A	No	3-Alarm Fire, City of Rochester for 6.75 hours. The event prompted activation of the Emergency Operations Center.
June 19, 2001	Landfill Fire	N/A	No	Mill Seat Landfill Fire in the Town of Riga for one hour. The event prompted activation of the Emergency Operations Center.
August 4, 2010	Wildfire	N/A	No	Fire detected in the Town of Webster
August 19, 2011	Wildfire	N/A	No	Fire detected in the Town of Webster
July 4, 2012	Wildfire	N/A	No	Fire detected in the Town of Webster
August 3, 2012	Wildfire	N/A	No	Fire detected in the Town of Webster
April 28, 2013	Brush Fire/Barn Fire (Orleans County)	N/A	No	The Kendall Fire Department was dispatched, along with the Carlton Fire Department, to a barn fire at 1857 Transit Road in the Town of Kent (Orleans County). The barn actually was situated in a triangular plot created by the Transit Road and the Roosevelt Highway. The header created by the large fire could be seen for miles from the incident. Kendall 1 arrived and immediately requested mutual assistance from several neighboring departments. Engines and tankers were requested from the Town of Hamlin. The fire consumed a large barn, spread to adjoining structures and vehicles, and created a brush fire that extended into a lightly wooded area north of the structures. It was reported that dynamite was stored in one standing building, and the Rochester Bomb Squad was called to the scene. Firefighters remained at the scene for several hours.
May 6, 2013	Brush Fire	N/A	No	Rochester firefighters responded for the report of a brush fire at Turning Point Park. Engine 19 went on location and reported a large area of brush burning. Additional equipment was dispatched to help extinguish the fire.
May 20, 2013	Wildfire	N/A	No	Fire detected in the Town of Hamlin
May 20, 2013	Wildfire	N/A	No	Fire detected in the Town of Hamlin
June 5, 2013	Brush Fire	N/A	No	Brighton firefighters responded for the report of a brush fire at the Town of Brighton dump on Browncroft Blvd. Engine 303 went on location with a 200 feet ×200 feet pile of trees and brush on fire. Multiple mutual aid was called in to assist with fighting the fire. The cause of the fire is under investigation.
April 21, 2014	Wildfire	N/A	No	Between one and three fires were detected in the Town of Rush
August 9, 2014	Wildfire	N/A	No	Fire detected in the Town of Webster
May 26, 2015	Wildfire	N/A	No	Fire detected in the Town of Hamlin

Sources: NASA FIRMS, 2015; Monroe County Fire Wire, 2015

Note: Monetary figures within this table were U.S. Dollar (USD) figures calculated during or after the approximate time of the event. If such an event would occur in the present day, monetary losses would be considerably higher in USDs as a result of inflation.

 FEMA
 Federal Emergency Management Agency
 N/A
 Not applicable





H.1.8 Hazardous Materials

Known hazardous materials events that have impacted Monroe County from 2010 to 2015 are identified in Table H.8. However, many of these fires are so small that little information is available. Therefore, Table H.8 may not include a complete record of all hazardous materials events that have occurred within the County.





Table H.8. Hazardous Materials Incidents in Monroe County, 2010 to 2015

Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
May 14, 2010	Oil Spill	N/A	No	Leakage of 100 gallons of waste motor oil occurred at the Pallet Express facility at 1069 Lyell Ave. in the City of Rochester. Emergency responders were dispatched to the scene. No other damages and/or losses were reported for the County.
May 26, 2010	Poisonous Material Leak	N/A	No	A leaky drum released poisonous material at the Bridge Terminal Transport Facility at 145 Colfax Street in the City of Rochester. An employee discovered free product leaking from an intermodal container. Cleanup crews discovered one leaking 600-pound metal drum. Approximately 20 pounds of free product was released. Marcor Environmental recovered the free liquid and overpacked the leaking drum. No other damages and/or losses were reported for the County.
August 26, 2010	Hydrogen Gas Spill/Explosion	N/A	No	An explosion occurred at Monroe County Fuel Farm on 1157 Scottsville Rd. in the City of Rochester when a transfer hose connecting a tube trailer to a customer supply system ruptured and released gaseous hydrogen that ignited explosively. The contents of the trailer, estimated at 90,000 GCF, were consumed in the ensuring fire that was allowed to burn off the hydrogen remaining in the trailer. Total costs of damages (material loss, carrier damage, and property damage), response, and remediation cleanup were estimated at \$311,000.
September 22, 2010	Diesel Fuel Spill	N/A	No	Spillage of 200 gallons of diesel fuel occurred at Route 390 and Route 590 in the Town of Brighton. No other damages and/or losses were reported for the County.
September 27, 2010	Chlorine Dioxide Spill	N/A	No	Spillage of 150 gallons of chlorine dioxide occurred at the University of Rochester Central Utilities Plant on 390 Elmwood Ave in the City of Rochester. No other damages and/or losses were reported for the County.
October 12, 2010	Diesel Fuel Spill	N/A	No	Spillage of 142 gallons of diesel fuel occurred at the CSX rail yard at 419 Atlantic Ave in the City of Rochester. No other damages and/or losses were reported for the County.
December 23, 2010	Diesel Fuel Spill	N/A	No	A commercial vehicle accident at 900 Jefferson Road in the Town of Henrietta caused a Superior Trucking vehicle to spill 125 gallons of diesel fuel onto the impervious surface and into sewers along the road. No other damages and/or losses were reported for the County.
July 8, 2011	Chemical Product Spill	N/A	No	Spillage of 1300 gallons of driveway sealer occurred near the intersection of Route 204 and Route 490 in the Town of Gates. No other damages and/or losses were reported for the County.





		PPB# A		
Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
May 20, 2011	Paint Spill	N/A	No	Release of 320 gallons of paint onto a trailer occurred at 15 Commercial Drive in the Town of Henrietta due to improper handling of the tote. An emergency response team was dispatched to handle cleanup at a cost of \$2,500. All product was absorbed with oil dry, placed into a salvage drum, and handled according to local, state, and federal regulations.
December 29, 2011	Nitric Acid Spill	N/A	No	SARA III – Between 500 and 1700 gallons of nitric acid was released at the Rochester Silverworks, 128 Ridgeview Ct., in the City of Rochester. The incident was the result of equipment failure, and the released materials affected soil and impervious surfaces. No other damages and/or losses were reported for the County.
January 4, 2012	Transform Oil Spill	N/A	No	Spillage of 25,000 gallons of transform oil occurred in the Town of Henrietta at the Rochester Gas and Electric substation on Lehigh St. No other damages and/or losses were reported for the County.
March 14, 2012	Diesel Fuel Spill	N/A	No	Spillage of 110 gallons by Cavalier Trucking occurred on 225 Buell Road in the Town of Gates. No other damages and/or losses were reported for the County.
December 6, 2012	Grease Spill	N/A	No	Spillage of 250 gallons of cooking grease occurred at Applebee's at Route 205 and Route 31 in the Town of Perinton. No other damages and/or losses were reported for the County.
March 7, 2013	Chlorine Leak	N/A	No	Henrietta firefighters responded to a report of a chlorine leak at RIT Building 17, the Micro Electronics Building, in the Town of Henrietta. The company assumed command and declared a Level 0 HAZ MAT. After an investigation of the chlorine leak, the assignment was upgraded to a Level 1 HAZ MAT, which brought the Monroe County HAZ MAT team to the scene. Firefighters secured the scene and turned the incident back over to RIT. No other damages and/or losses were reported for the County.
April 10, 2013	Ammonia Leak	N/A	No	Ridge Road firefighters responded this evening to a report of smoke from the front of the building on Lexington Ave in the Town of Greece. Command requested a Level 1 HAZ MAT for a 55-gallon drum of Chlorine Dioxide / Ammonia leaking. The Monroe County HAZ MAT team secured the leak, and the cause of the fire was investigated. No other damages and/or losses were reported for the County.
May 15, 2013	Dichlorosaline Leak	N/A	No	Town of Henrietta firefighters responded in the morning to a gas alarm at Building 17 on the RIT campus in the City of Rochester. 6C62 requested a Level 0 HAZ MAT response. Car 826 requested a Level 1 HAZ MAT response for an unknown hazard in the building. HAZ MAT team members made entry and secured the leak. No other damages and/or losses were reported for the County.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
May 21, 2013	Chemical Fumes	N/A	No	The Town of Henrietta Fire Department responded with a Level 1 HAZ MAT team to an apartment at 80 Colony Manor Drive on the RIT campus in the City of Rochester. The investigation was tied to a student who had become ill and was later treated at Strong Memorial Hospital. No other injuries related to the incident occurred, and the complex was not evacuated.
August 15, 2013	Chemical Fumes	N/A	No	City of Rochester firefighters responded to a report of a person with trouble breathing on University Ave. Engine 17 went on location and declared a Level 0 HAZ MAT for a city worker overcome by fumes. Command requested a Level 1 HAZ MAT for a city worker overcome by an unknown chemical. Firefighters secured the leak and turned over the scene. No other damages and/or losses were reported for the County.
October 18, 2013	Train Derailment	N/A	No	7 rail cars carrying soybeans derailed and overturned in the Town of Perinton. No injuries or property damages were reported, but the event reaffirmed hazard potential for a HazMat spill in the area.
December 5, 2013	Unknown Product Spill	N/A	No	During the loading process of a transport tank trailer at the Buckeye south loading rack in the City of Rochester, the driver hooked up to a 1,000-gallon compartment and programed the equipment to load 2,000 gallons. The overfill system on the cargo tank failed to immediately stop the flow of product, resulting in 30-150 gallons of gasoline released onto impervious surface. The spilled product was contained within the loading rack containment area and cleaned up. No other damages and/or losses were reported for the County.
January 3, 2014	Hazardous Substance Spill	N/A	No	SARA IIINO – 800 gallons of an unknown HazMat was reportedly spilled at the Eastman Kodak Plant at 480 Maplewood Drive in the City of Rochester, contaminating soils on site. The spill was the result of an equipment failure. No other damages and/or losses were reported for the County.
February 25, 2014	Hazardous Substance Spill	N/A	No	SARA IIINO – 5000 gallons of a hazardous substance was reportedly spilled at the Eastman Kodak Company at 1669 Lake Avenue in the City of Rochester, contaminating soils and groundwater. No other damages and/or losses were reported for the County.
May 8, 2014	Diesel Fuel Spill	N/A	No	City of Rochester firefighters responded to a report of a diesel fuel spill at the scene of a motor vehicle accident on State Route 490 and the Freddie Sue Bridge. Command requested a Level 1 HAZ MAT to assist with the cleanup and to stop the leak. Somewhere between 40 and 85 gallons of diesel fuel was spilled onto the pavement and into the sewer. No other damages and/or losses were reported for the County.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 11, 2014	Unknown Product Spill	N/A	No	Roughly 20 gallons of material was released on the floor of a truck, and about 2 gallons was released on the side of the road in the City of Rochester. The damage to the tote occurred due to sudden braking from a near miss motor vehicle accident. A total of \$3,500 in damages was reported.
June 17, 2014	Chemical Spill	N/A	No	Employees at a transit storage facility at 335 McKee Road, City of Rochester were using a cargo tank vehicle to remove kerosene from a frack tank. Product from an earlier bulk tank spill that was mixed with water was being drawn into this tank wagon from a transmix tank when, during the recovery process, the Victaulic coupling underneath the tank wagon failed, and approximately 20 gallons of product spilled to the concrete/asphalt pad on which the truck was parked.
October 1, 2014	Fuel Spill and Fire	N/A	No	Rochester firefighters responded to a report of a fire in the yard of the Ben Weitsman Recycling company on Steel St. in the City of Rochester. Engine 3 went on location to find gasoline and other flammable liquids on fire next to a building. Battalion 2 assumed command and declared a working fire. Command requested Engine 10 to assist with water support and the HAZ MAT team. Command reported that 800-900 gallons of fuel was burning, and 250 gallons had spilled. No other damages and/or losses were reported for the County.
October 1, 2014	Chemical Spill	N/A	No	Kodak firefighters along with City of Rochester firefighters responded this afternoon to a reported leak from a 55-gallon drum of acetic anhydride. Command declared a Level 1 HAZ MAT. Firefighters contained the spill and secured the scene. No other damages and/or losses were reported for the County.
January 16, 2015	Fuel Spill	N/A	No	City of Rochester firefighters responded this afternoon to a reported fuel oil spill on Sylvester St. Engine 16 reported spillage of two 5-gallon buckets of oil inside the house and outside as well. Engine 16 declared a Level 0 HAZ MAT, which brought Engine 17, Rescue 11, and HAZ MAT 1 & 2. Battalion 1 assumed command and declared a Level 1 HAZ MAT. Thirty gallons of #2 fuel oil was spilled. No other damages and/or losses were reported for the County.
February 13, 2015	Chemical Spill	N/A	No	A 55-gallon poly drum of a water treatment chemical fell through the wood skid on which it had been staged during delivery at Winston Place in the Town of Henrietta. The broken skid resulted in a puncture in the bottom side of the drum and total release of the product to the floor of the trailer and the asphalt parking lot on which the trailer was parked. The cold weather froze the product in the trailer and the asphalt. The released material was shoveled up and collected by use of absorbents. The damaged drum was placed in an overpack. The recovered material was collected and taken for disposal. A total of \$3,500 in damages was reported.





Date(s) of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts		
March 18, 2015	Fuel spill	N/A	No	Egypt firefighters responded to a reported motor vehicle accident in the Town of Pittsford on Palmyra Rd. Command requested a Level 1 HAZ MAT for 15 diesel fuel leaking along with another chemical. Firefighters secured the scene and turned it over to the police. Fifteen gallons of diesel fuel was spilled. No other damages and/or losses were reported for the County.		
Source: Monroe County 2015; Monroe County Fire Wire 2015; NYS DEC 2015; PHMSA 2015; U.S. EPA 2015						
HAZ MAT or HazMat Hazardous Materials						
GCF	Gas Cubic	Feet				





H.1.9 Landslide

Known landslide events that have impacted Monroe County from 1993 to 2015 are identified in Table H.9. As landslide events are not well documented, Table H.9 may not include a complete record of all landslide events that have occurred within the County.





Table H.9. Landslide Events between 1993 and 2015

Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
1993, 1997, 1998	Shoreline Erosion	N/A	No	High water levels on Lake Ontario exacerbated erosion along its shoreline. When the lake level reached 246.3 feet, erosion escalated. In these years, erosion swallowed land mass, trees and other vegetation, and artificial fill that property owners utilized as bank stabilization, some of which was placed through a U.S. Army Corps of Engineers "Advanced Measures Program" in the 1970s. Natural features have also been adversely affected by landslide. In Monroe County, cliffs along the shoreline in the Town of Webster, and along the Irondequoit Bay have been eroded. In 1998, severe erosion exposed a sanitary sewage transmission main near Sea Breeze, in the Town of Irondequoit, prompting emergency measures for repair and a call for immediate protective relief from the International Joint Commission that regulates lake levels.
April 2, 1997	House slid off Foundation/Water Main Break	N/A	No	A house on the west side of Irondequoit Bay, in the Town of Irondequoit, slid off its foundation into the bay. It is unknown whether a water service break at the house site caused the slide, or if the slide ruptured the water service. No one was home at the time of this event and no other properties were damaged (Greg Merrick, Irondequoit Fire Marshal, telephone interview, 8-12-03)
January, 1998	Saturated Soils	N/A	No	In the Town of Webster, a basement wall on the uphill side of the house collapsed from the pressure of saturated soils and downhill drainage.
August 31, 2004	Washout/ Landslide	N/A	No	Town of Irondequoit Supervisor, David Schantz called OEM to report a major wash-out on the slope above "German Village," off Point Pleasant Road on the Westside of Irondequoit Bay. Five private homes were jeopardized. Town Officials, geo-technical Engineers, and utilities were involved. OEM briefed SEMO. "Excessive rain saturated the hillside. That deluge caused brush and dirt to slide 40 feet toward about a dozen bayside houses known as German Village" (Democrat & Chronicle, 7.29.06).
July 28, 2006	Landslide	N/A	No	An Irondequoit resident awoke, "To find her lawn and walkway covered with water and debris, runoff from a neighboring hillside. "Water was gushing like a small river, and the sump pump is running constantly" (Democrat & Chronicle, 7.29.06).
August 10, 2009	Erosion, Unstable Banks	N/A	No	"County Executive, Maggie Brooks, today announced the County was forced to cordon off a section of Ellison Park from public use as a result of dangerous conditions created by unstable banks along Irondequoit Creek. Significant stretches of Irondequoit Creek within both Powder Mills and Ellison Parks have been greatly impacted by storm water flow and other forms of erosion, seriously compromising the structural integrity of its banks" (Monroe County News Release, 8.10.09).

Sources: Monroe County, 2015

FEMA Federal Emergency Management Agency

N/A Not applicable



H.1.10Civil Unrest

Known civil unrest events that have impacted Monroe County from 1993 to 2015 are identified in Table H.10. As landslide events are not well documented, Table H.10 may not include a complete record of all landslide events that have occurred within the County.





Table H.10. Civil Unrest Events between 1993 and 2015

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Monroe County Designated?	Description
July 24-27, 1964	Riots	N/A	No	Riots raged for 3 days in the City of Rochester in the aftermath of an arrest of a young black male at a street block party and dance off Joseph Avenue, during the late evening hours of July 24, 1964. The riots started with roughly 400 people in two of the City's predominantly black wards, near the intersection of Nassau Street and Joseph Avenue. Adjacent areas of the City, including downtown, were involved over the coming days, when rioting crowds swelled to more than 2,000 people. City police, state troopers, and sheriff's deputies were all called to the scene. On July 25, City Manager Porter Homer ordered an 8:00 p.m. city-wide curfew, and closed all liquor stores in the City and surrounding municipalities. However, violence surged as rioters threw Molotov cocktails, rocks, and bottles from rooftops and store windows. Governor Nelson Rockefeller declared a state of emergency and called in the New York National Guard—the first use of those troops for that purpose in a northern city. The riots left 4 people dead (3 in a helicopter crash) and 350 injured. Almost a thousand people were arrested, the majority between 20 and 40 years old, employed, with no prior record. Fifteen percent of those arrested were white. Stores either looted or damaged numbered 204.
March 25, 2010	Vandalism	N/A	No	A brick was thrown at the office door of the Monroe County Democratic Committee in the City of Rochester by opponents of President Obama's contentious healthcare reform measure that had been signed into law earlier in the week.
October 31, 2011	Protest	N/A	No	Two men with the "Occupy Rochester" protesters were arrested for violating city ordinances at a park in the City of Rochester where 32 demonstrators had been rounded up on trespassing charges three nights earlier. One man was accused of violating Rochester's municipal code for tying a "Liberation Square Rochester" sign to a Civil War monument in Washington Square Park. Another was ticketed for sleeping in the park. However, Mayor Thomas Richards said that the arrests had been intended to prevent confrontations over health and safety concerns related to the multi-week occupation.
August 11, 2013	Riots	N/A	No	The City of Rochester Police Department arrested 16 people following the annual Puerto Rican Festival after festival participants allegedly threw rocks, bottles, and eggs at police officers. Pepper balls, a helicopter, and other crowd control measures, along with about 100 police officers in riot gear, were deployed to calm the situation.
September 15, 2014	Protest	N/A	No	Homeless advocates were arrested and charged with criminal trespassing after protesting outside a Monroe County office building in the City of Rochester. The dissenters protested cancellation of a scheduled meeting of County officials to discuss the City's homeless problem and emergency housing shelter availability.
September 21, 2014	Unruly Crowd	N/A	No	At least a thousand people took to the streets in the Village of Brockport overnight between Saturday night and Sunday morning when the Brockport Police Department ordered the bars to close an hour early at 1 a.m. over safety concerns. Homecoming weekend at the College at





Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Monroe County Designated?	Description
				Brockport: State University of New York was the cause of such a large crowd gathering in the Village, and when ordered to exit the bars, people flooded the streets and started shouting "U-S-A!" and "Let's Go Brockport." More than 30 police officers from 13 different departments arrived at the scene, arresting 28 people, at least 3 of whom were students. Police Chief Daniel Varrenti told a news reporter that the event was not a riot.
November 30, 2014	Rally	N/A	No	Hundreds rallied in the downtown area of the City of Rochester to protest a grand jury's decision not to indict Ferguson, MO Police Officer Darren Wilson for the killing of Michael Brown, an unarmed black teenager. The rally did not include city officials. No property damage or violence was reported.
April 14-15, 2015	March	N/A	No	Marchers gathered on East Avenue and Mount Hope Avenue in the City of Rochester to fight for wage equality, including equal pay for women, higher wages for workers, and more options for workers to form unions. The marches were organized by a number of advocacy groups, workers, and churches.
May 1, 2015	March/Protest	N/A	No	Protesters marched in the City of Rochester in solidarity with people marching in Baltimore, after that City's top prosecutor announced charges Friday against six officers involved in the arrest of a black man whose neck was broken in police custody. The court's decision came amid outrage around the country over police brutality against African Americans. The Rochester protesters called for an end to the violence.

Sources: Democrat and Chronicle 2013; PBS 2015; Rochester Homepage 2015; Syracuse.com 2011; Syracuse.com 2014; The Guardian 2010; Time Warner Cable News 2015





H.1.11 Terrorism

Known terrorism events that have impacted Monroe County from 2000 to 2015 are identified in Table H.11. As terrorism documentation is not always well documented, Table H.11 may not include a complete record of all terrorism events that have occurred within the County.





Table H.11. Terrorism Events in Monroe County between 2000 and 2015

Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
May 31, 2014	Terrorist Activity	City of Rochester	Not applicable (N/A)	N/A	A City of Rochester man was arrested and later indicted on charges that he tried to provide material support to the Islamic State. The 30- year-old store owner was arrested and charged with funding the Islamic terror group ISIS, trying to fuel them with jihadists, and plotting to kill U.S. troops, according to federal authorities. He was also charged with one count of attempting to gun down government officers and employees, two counts of having an unregistered firearm silencer, and one count of possessing guns or silencers.

Sources: NY Daily News 2014





H.1.12 Utility Failure

Known utility failure events that have impacted Monroe County from 1959 to 2015 are identified in Table H.12. As utility failure documentation is not always well documented, Table H.12 may not include a complete record of all terrorism events that have occurred within the County.





 Table H.12. Utility Failure Events in Monroe County, 1959 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
1959 - 1965	Power Outage	N/A	N/A	Major blackouts occurred throughout the Northeast in 1959, 1961, and 1965. Anywhere from one to a few cables failed in isolated places, causing overloads in a few more cables, and then a larger cascade of failures. The cascade gained momentum, produced catastrophe through the medium of the grid, and finally produced a shutdown of the whole system.
November 9, 1965	Power Outage	N/A	N/A	 Monroe County was "in the dark" with most of the east coast after a faulty relay broke in an Ontario Hydro power plant in Queenston, Ontario, near Niagara Falls, triggering a cascade of power surges that shut down electrical systems throughout the Northeast. The Great Northeast Blackout, as it came to be known, caused outages for more than 4 hours in the City of Rochester, beginning just around the time of evening rush hour. Intersections became clogged as traffic signals went down, service stations could not pump gasoline, people were stuck in elevators, television stations were knocked off the air, and seven aircraft had to circle above what then was called Rochester-Monroe County Airport when landing strip lights blinked out. Civil defense officials mobilized, and off-duty police officers and firefighters were called to work in case of unrest. None occurred. RG&E costumers were affected, while customers of Niagara Mohawk Corp. in the Towns of Riga, Wheatland, Rush, and parts of Henrietta and Mendon still had power. RG&E's power-generating system, which normally could produce enough power to cover its service area, was connected with other power companies in upstate New York that provided power through an eight-county area. When the relay broke in Ontario, power demands from the other utilities caused a power drain that overtaxed RG&E's generators and shut them down. Once RG&E engineers disconnected their system from the other companies, their own generators resumed operation. By 7:15 p.m., restoration of power began to hospitals and other priority users, and full restoration had occurred by 9:45 p.m.
August 14, 2003	Power Outage	EM-3186	Yes	 Known as one of the biggest blackouts in North America history, millions of people lost power shortly after 4:00 p.m. The blackout covered an area of 50 million people throughout the Northeast, affecting cities in New York, New Jersey, Ohio, Connecticut, Michigan, Massachusetts, as well as several major cities in Canada, including Toronto and Ottawa. In Monroe County, the Emergency Operations Center (EOC) was activated for 16.5 hours beginning on August 14th. County Executive Jack Doyle declared a State of Emergency for all of Monroe County on August 14th, and ordered no unnecessary travel. The declaration and order were rescinded on August 15th.





Table H.12. Utility Failure Events in Monroe County, 1959 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				Approximately 67-80 percent of RG&E customers (about 400,000) in the County were without power. Niagara Mohawk customers within the County were also affected. Kodak Park shifted electric load back to company generation for mission-critical areas, but otherwise did not alter normal operations.
				Frontier, a distributer of telephone service in the region, reported that fewer than 1,000 telephone customers lost land-line service during Thursday's power outage. The company operated some central offices and loop stations by use of batteries/back-up generators.
				City of Rochester Fire Chief Floyd Madison reported 12 minor fires on Thursday night and Friday morning, 6 of which were blackout-related. In addition, three fire stations lost power and were not able to acquire back-up power.
				Ginna Nuclear Generating Station in Wayne County shut down. Ginna is one of six in the State and nine nationally that were shut down. Dark traffic lights numbered 575. Hospitals operated by use of back-up generators. The generator at Park Ridge Hospital in the City of Rochester failed. County Pure Waters deployed a generator, and its electricians worked with RG&E crews to repair the hospital's generator. Commercial power was restored in under 2 hours.
				The Rochester Airport lost outside power, and one of its two back-up generators failed, leaving passengers unable to board flights for nearly 3 hours. Monroe County Water Authority and the Pure Waters District (sewage) both had pump stations operating by use of generated power. Red Cross and County Health Department opened two venues for people with medical appliances who needed power access.
				On the morning of the 15 th , RG&E and Niagara Mohawk both announced that "rolling blackouts" were ordered by the ISO to stabilize the restoration effort. Governor Pataki asked for federal emergency declaration to provide federal money for relief efforts.
November 17, 2006	Gas Leak	N/A	N/A	More than 300 Town of Greece families (700 residents) had to find temporary housing after a routine inspection of natural gas lines at the Cedar Commons apartment complex detected leaks so dangerous that the complex's gas service had to be immediately disconnected for safety purposes. RG&E assisted Cedar Commons to locate materials and qualified workers needed to make the repairs as soon as possible. Jeff McCann, Greece Town Deputy Supervisor, said the town was made aware of the problem, and





Table H.12. Utility Failure Events in Monroe County, 1959 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				that complex managers told the town they would voluntarily relocate more than 316 families from the complex during repairs. All residents were able to return with availability of heat and hot water 5 days later after more than 9,000 feet of gas line had been replaced throughout the complex.
February 16, 2007	Power Outage	N/A	N/A	An equipment failure at a substation left about 2,500 RG&E customers without power for over an hour during the afternoon of February 16th. The power outage affected customers in Corn Hill and the western part of South Wedge in the City of Rochester.
January 28, 2007	Sanitary Sewer	N/A	N/A	Residents of aging suburbs like the Towns of Irondequoit, Brighton, East Rochester, and Greece faced flooding caused by insufficient storm sewer capacity. Irondequoit residents reported that heavy precipitation led to sewage in their basement and tens of thousands of dollars of damage to their properties. An Irondequoit DPW employee estimated that nearly 10,000 homes were impacted by decaying sewer infrastructure. Some infrastructure pipes were laid early in the 1900s.
September 7, 2007	Power Outage and Water Supply Failure	N/A	N/A	 School was cancelled in Spencerport because of a failed electric transmission line that affected more than 38,000 RG&E customers in western Monroe County. Power was restored to most customers less than 2 hours after failure. OEM files indicate this was not an Electric Grid problem. This was a supply failure on a 115 kilovolt (KV) transmission line that was scheduled for comprehensive maintenance testing within a week of the failure. RG&E's analysis of the problem and the system included inspection from the ground, the air, and thermal imaging. They also removed a section of the damaged line for testing and analysis. This failure resulted in some water pressure problems and water supply failure at the Wheatland-Chili School. With system redundancy through switching, all customers were restored.
June 2, 2008	Power Outage	N/A	N/A	Roughly 900 RG&E customers were without power for just over an hour, starting at 9:00 p.m. Power was restored by 10:23.
May 8, 2010	High Wind	N/A	N/A	Deep low pressure passed over western New York with its trailing cold front rapidly sweeping east across the region. Winds increased within a few hours of the approaching front to gust speeds of 60 to 65 mph. Tens of thousands were left without power. There were reports of vehicles and/or buildings damaged by falling trees. RG&E's Monroe County and Canandaigua service areas were hardest hit.
July 17, 2010	Power Outage	N/A	N/A	About 1,000 households were temporarily without power in Monroe and Ontario Counties after a tree fell onto electrical wires at 2:45 p.m. Affected areas in Monroe County included the Town of Henrietta, the Village of Honeoye Falls, and the Town of Webster until restoration by 5:30 p.m.





Table H.12. Utility Failure Events in Monroe County, 1959 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
July 21, 2010	Thunderstorm Wind	N/A	N/A	Thunderstorms developed ahead of an approaching cold front. The thunderstorms produced large hail and damaging winds. Thunderstorm winds downed trees and power lines in the City of Rochester and Town of Brighton. Utility companies reported thousands without power.
August 19, 2010	Thunderstorm Wind	N/A	N/A	Thunderstorms developed ahead of an approaching cold front during the late afternoon hours. In Monroe County, the thunderstorms produced strong winds that downed trees and power lines. At the Long Pond Shores apartment complex in the Town of Greece, a large tree fell on part of the building. Fallen limbs were scattered along Lakeshore Road in the Town of Irondequoit. Electric Utilities reported about 150 homes without power in the Towns of Irondequoit and Webster.
August 28, 2011	Hurricane Irene	EM-3328	Yes	Hurricane Irene tracked northeast along the Atlantic Coast and brought gusty winds to eastern sections of the area. Measured winds gusted to 40 to 45 mph. Normally, winds of this magnitude are not strong enough to cause damage; however, the ground was wet and the north to northeast flow of wind was opposite of the prevailing direction for the region. Trees are anchored for the prevailing direction and are susceptible to even marginally strong winds from the opposite direction. Downed trees and lines were reported in the Town of Greece and the City of Rochester. Utilities reported several thousand customers without power.
January 17, 2012	Thunderstorm Wind/High Wind	N/A	N/A	Low pressure moved across southern Ontario and pulled a strong cold front across the region during the evening hours. Thunderstorms accompanying the front produced wind gusts to around 70 mph. The strong winds downed trees and power lines and poles. Power outages were scattered throughout the region, with utilities reporting several thousand without power at its worse. Utilities reported several tens of thousands without power at the peak of the storm. Specific gusts included one of 72 mph at Rochester.
February 24, 2012	High Wind	N/A	N/A	Low pressure over the Ohio Valley deepened as it lifted northeast across the Great Lakes then down the St. Lawrence Valley. The low brought strong winds to the region. Trees and power lines were downed. Scattered power outages were reported. Measured gusts included one of 53 mph at Rochester Airport.
March 3, 2012	High Wind	N/A	N/A	Deep low pressure moved from the Midwest across Lake Huron into Quebec. Southeast winds gusting to 55 mph quickly shifted to the southwest, and increased to 30 to 40 mph with gusts nearing 70 mph. The strong winds downed trees and power lines. Utilities reported several tens of thousands without power at the peak of the storm. Specific gusts included one of 66 mph at Rochester Airport and 59 mph in the Town of Irondequoit.
May 29, 2012	Hail	N/A	N/A	A strong cold front was accompanied by severe thunderstorms that produced hail up to 1.75 inches in diameter, and damaging winds which downed trees and power lines. Utilities reported tens of thousands without power scattered throughout the region.





Table H.12. Utility Failure Events in Monroe County, 1959 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
October 29, 2012	High Wind	N/A	N/A	Remnants of Superstorm Sandy brought strong winds and heavy rains to western and north central New York. The high winds downed trees and power lines throughout the region. Wind gusts were measured to 60 mph, for example, at Irondequoit Bay. Tree damage was greater than usual with such wind speeds because of saturated ground and northeast winds—opposite of the normal prevailing southwest direction. Utilities reported tens of thousands of customers without power across the entire region. On the 30 th , RG&E reported that 22,300 Monroe County customers were without power, though by the end of the day only 13,800 customers remained in the dark. Power was restored to all RG&E customers by November 2 nd .
January 20, 2013	High Wind	N/A	N/A	A deepening storm system moved across the Upper Great lakes. The system brought strong, damaging winds to the entire region late Saturday night into Sunday (20th-21st). Trees, power poles, and wires were brought down by the winds. Utilities reported tens of thousands without power for a time. Specific measured gusts included one of 59 mph at the Rochester Airport.
January 31, 2013	High Wind	N/A	N/A	Low pressure moved across the lower Great Lakes, swinging a strong cold front across the region. In the wake of the front, strong westerly winds overspread the area. The wind downed trees and power lines. Utility companies reported scattered outages across the region. Specific wind gusts recorded included one of 59 mph at the Rochester Airport.
February 2013 – January 2014	Power Outages	N/A	N/A	Parts of the Town of Webster were affected by repeated power outages over a series of months, including five mini-blackouts that affected the same 4,250 customers. A 1.5-mile stretch of a 49-year-old, sub-transmission line in the west part of the Town of Webster known as Circuit 745 went out of service twice in November because of contact by tree limbs, and then failed on Dec. 28, Jan. 6, and on Jan. 11, each time breaking at a point where it previously had been spliced together. Parts of the town not served by Circuit 745 also underwent repeated losses of electric service, and the town logged more customer-hours with no electricity over a one-year period than any other municipality in Monroe County.
July 18, 2013	Thunderstorm Wind	N/A	N/A	Scattered thunderstorms developed during the afternoon hours. An isolated thunderstorm over Monroe County produced damaging winds that downed trees and power lines in the Town of Greece. The Towns of Greece, Irondequoit, and Webster, and the northern portion of the City of Rochester took the brunt of the damage in Monroe County, where 2,900 RG&E customers were without power for up to 3 days.
November 1, 2013	High Wind	N/A	N/A	Deep low pressure lifted across the Great Lakes region. The system brought strong winds to much of the region on Friday, November 1st. Winds gusted as high as 62 mph. Approximately 13,600 RG&E customers lost power after the high winds knocked down trees and branches, took down transmission and distribution lines, and snapped utility poles in the area. In total, more than 27,000 RG&E customers in Monroe, Wayne, and





Table H.12. Utility Failure Events in Monroe County, 1959 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				Ontario counties lost power as result of the storm, with the towns along Lake Ontario bearing the worst of the damage. The most significant outages were in the Towns of Greece (3589), Ogden (2952), Webster (1481), Irondequoit (1298), Chili (1204), Gates (638), Penfield (411), and Parma (349); and in the City of Rochester (1175). Power was restored by the evening of November 2.
November 18, 2013	High Wind	N/A	N/A	Rapidly deepening low pressure tracked from the Upper Great Lakes to James Bay, and brought strong winds to the entire region. The winds, gusting as high as 68 mph, brought down trees and power lines throughout the region, reflected in numerous reports of damage from downed trees. Power outages were in the tens of thousands. Specific measured wind gusts included one at 63 mph at Rochester Airport.
November 26-28, 2013	Winter Storm	N/A	N/A	Power lines and electric utility equipment were damaged by an overnight storm that dumped between 6 and 10 inches of heavy, wet snow. RG&E estimated that more than 17,500 customers total and 1,331 in Monroe County lost power at some point during the storm that toppled trees, knocked down 216 power lines, and fractured 12 utility poles across its service area. The largest outages occurred in the Towns of Brighton (478), Pittsford (303), and Henrietta (146), and the City of Rochester (108). Power was restored to RG&E customers less than 2 days later.
December 20, 2013	Phone Outages	N/A	N/A	At approximately 9:25 a.m., the Monroe County 911 Center called Frontier, a telephone service company, to report a problem with 911 telephone service. Frontier started trouble shooting and called its 911 manager. While Frontier was trouble shooting, the 911 Center contacted local media to inform them of the situation. Frontier's 911 manager instructed the 911 Center to activate the emergency backup switch, which routed all 911 traffic to the back-up Norstar system, displaying Caller-ID only. Frontier discovered a scan point circuit failure due to a defective trunking cable between Fitzhugh St. and Field St. in the City of Rochester, and made repairs.
December 21, 2013	Ice Storm	N/A	N/A	A surface front stalled across the region and acted as a pathway for periods of heavy precipitation. North of the front, the precipitation fell as freezing rain, coating trees, power lines, and all exposed surfaces with ice. Across the Niagara Frontier, ice accumulations of 0.5 to 1 inch were reported. Across the north country, where the freezing rain persisted the longest, ice accumulations ranged from 1 to 2 inches. Weight of the heavy ice brought down trees and power lines. In some cases, trees fell on homes, buildings, and automobiles. Tens of thousands were left without power.
July 8, 2014	Thunderstorms	N/A	N/A	A line of intense thunderstorms blew through the Rochester region the afternoon of July 7. High winds, torrential rains, and plentiful lightning damaged many parts of RG&E's electric distribution system, and caused outages for more than 31,000 customers across all areas of its system. At the peak of the storm, more than 27,000 RG&E customers were out of service, 290 of them within Monroe County. Areas with the most outages in





Table H.12. Utility Failure Events in Monroe County, 1959 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				Monroe County included the Towns of Pittsford (156), Perinton (43), and Webster (Town and Village) (75). Power was restored by the end of the next day.
August 1, 2014	Flood	N/A	N/A	Thunderstorms developed in a moderately unstable airmass along the lake breeze boundary that extended across the lower Genesee Valley and Western Finger Lakes. The thunderstorms produced damaging winds that downed trees and wires in the Town of Greece. The heavy rains that fell resulted in urban flooding. Storm sewers were not able to keep up with the intense rainfall, and streets closed in the Town of Greece.
January 4, 2015	High Wind	N/A	N/A	Deepening low pressure tracked from western Lake Erie across far southern Ontario to Quebec dragging a cold front across the region. Strong winds increased to near 60 miles per hour (mph) about 2 to 3 hours after the cold front passage. The strong winds downed trees and wires across western New York. Damage was reported along St. Paul Boulevard in the Town of Irondequoit. Scattered power outages resulted throughout the region.

Source: NOAA-NCDC, 2015; Monroe County 2010 HMP; Democrat and Chronical, 2006, 2007, 2008, 2010, 2014; RG&E 2015.

DPW Department of Public Works

ISO International Organization for Standardization

KV Kilovolt

mph Miles per Hour

NCDC National Climatic Data Center

NOAA National Oceanic and Atmospheric Administration

RG&E Rochester Gas and Electric



APPENDIX I. NYS DHSES PLANNING STANDARDS

This appendix includes the 2017 NYS DHSES planning standards and guidelines for hazard mitigation planning.





New York State Hazard Mitigation Planning Standards

Congratulations on taking the first steps to create or update a multi-hazard mitigation plan for your community! Based on New York State's disaster history, the New York State Division of Homeland Security and Emergency Services (NYS DHSES) has developed the following mitigation planning standards. While we recommend incorporation of these standards into <u>all</u> mitigation plans, these are required actions for any mitigation plan developed with funds administered by NYS DHSES.

The goal of both NYS DHSES and FEMA is that all jurisdictions develop robust mitigation plans and tangible mitigation actions that will contribute to long-term risk reduction. These requirements are intended to improve the quality of hazard mitigation plans and encourage the development of the most appropriate and effective mitigation projects for your community. It is recognized that many jurisdictions have inherent constraints and certain information may be difficult to provide. NYS DHSES and FEMA will work with you throughout the entire planning process to ensure the successful development of your community's hazard mitigation plan.

There are a multitude of resources that exist to provide guidance and support throughout the planning process, developed by Federal and State agencies, as well as private and research based groups:

The **NYS Hazard Mitigation Planning Standards Guide** provides supplemental guidance and information to support efforts to meet the NYS Planning Standards. This will be made available online, and is included as an attachment.

The **2013 Local Mitigation Planning Handbook** is the official guide for local governments to develop, update and implement local mitigation plans: https://www.fema.gov/media-library/assets/documents/31598?id=7209

The **2011 Local Mitigation Plan Review Guide** provides an overview of the tool that FEMA and NYS DHSES will use to revise plans: <u>https://www.fema.gov/media-library/assets/documents/23194</u>

Beyond the Basics: Best Practices in Local Mitigation Planning is a website developed by the University of North Carolina which expands on FEMA's Handbook and features numerous examples and best practices from resources across the country: http://mitigationguide.org/

We urge you to utilize the information available and to contact us so that we may direct you to additional resources and provide you with the most comprehensive technical assistance possible.

For questions and comments, please call our offices at 518-292-2304.

Additional contact information will be provided to sub-recipients for more direct assistance.

Please note:

Jurisdiction is used to describe all government entities within the boundaries set forth in the Multi-Jurisdictional Plan (typically County-wide), including the County itself, as well as cities, towns, villages and tribal entities.

Special Flood Hazard Area (SFHA) is defined as the area that will be inundated by the flood event having a 1-percent change of being equaled or exceeded in a given year (also known as the 100-year flood event).

1. Establish Jurisdictional Teams

Plans developed with the participation of the widest range of organizations and stakeholders personally familiar with past damages to local infrastructure are likely to contain valuable, relevant information that will lead to a comprehensive plan and feasible projects.

Jurisdictions must invite key stakeholders at the start of and throughout the planning process.

• The plan must document how stakeholders were invited to participate at each phase of the planning process, and provide a summary of feedback.

2. Assess Critical Facilities

Critical facilities must remain accessible and functional before, during and after disasters to meet the jurisdictions Continuity of Government (COG) and Continuity of Operations (COOP) standards, and to support important emergency, government and sheltering functions.

Jurisdictions must identify all critical facilities, assess vulnerabilities and ensure protection to a 500-year flood event. Critical facilities located in an SFHA, or having ever sustained previous flooding, must be protected to the 500-year flood event, or worst case scenario.

- The plan must document the name of facility, type of facility, jurisdictional location, and exposure to a 100- and 500-year event.
- The plan must document that critical facilities are protected to the 500-year flood event, or worst damage scenario. For those that do not meet this level of protection, the plan must include an action to meet this criteria, or explain why it is not feasible to do so. (See State Standard 7 for additional requirements related to project identification.)

3. Plan for Displaced Residents

Intermediate and long-term housing options must be available to relocate displaced residents to maintain post-disaster social and economic stability.

Jurisdictions containing an SFHA must identify potential sites that are compliant with the NYS Uniform Fire Prevention and Building Code (with first flood elevation placed no less than 2' above the Base Flood Elevation) for the placement of temporary housing units for residents displaced by disaster; and potential sites within the jurisdiction suitable for relocating houses out of the floodplain, or building new houses once properties in the floodplain are razed.

• The plan must document the location of viable sites, and include a letter from the local floodplain administrator certifying viability or listing any actions required to ensure conformance.

4. Plan for Evacuation and Sheltering Needs

Evacuation and sheltering measures must be in place and available for public awareness to protect residents and mitigate risk, stress and personal hardships during hazard events.

Jurisdictions must identify routes and procedures to evacuate citizens prior to and during an event, and identify shelters for evacuated citizens. Provisions must be included for a range of medical needs, accommodation for pets, and compliance with the Americans with Disabilities Act (www.ada.gov).

- The plan must document (or refer back to such components in existing valid plan):
 - Evacuation routes and procedures;
 - Location of shelters (outside of the SFHA);
 - Specific information about how these plans are accessible and available to the public, or include the related narrative from those plans in an appendix.

5. Document Past Mitigation Accomplishments

Past mitigation actions provide a context for the jurisdictions' projects, and can help to evaluate accuracy of assumptions to support future mitigation planning.

Jurisdictions must identify mitigation projects completed since the approval of the previous mitigation plan (or within the last five years), regardless of whether the project was included in the previous plan or the project's funding source.

• The plan must document the original problem and estimated annual damages, the solution (project), the cost, the level of protection and its success since implementation.

6. Include Jurisdictional Annexes

Jurisdictional annexes provide a unique, stand-alone guide to mitigation planning for each jurisdiction.

The plan must be organized so that there is an annex for every jurisdiction within the county's borders, including the County.

- The plan must include a table in the Introduction section clearly identifying all jurisdictions and their level of participation.
- Each participating jurisdictional annex must include the following (at a minimum) and nonparticipating jurisdictions must include a cover sheet and should include as much information as is available:
 - Contact Information;
 - Jurisdiction Profile;
 - Hazard Identification (specific to the jurisdiction);
 - Hazard Event History;
 - National Flood Insurance Program (NFIP) Summary (to meet Federal Standards);
 - Critical Facilities Information (to meet State Standard 2);
 - Jurisdiction/public identified vulnerabilities;
 - Additional public involvement;
 - Capabilities Assessment;
 - Mitigation Strategy:
 - All identified previous mitigation activities with current status;
 - Previous mitigation activities completed (to meet State Standard 5);
 - All proposed mitigation activities (both new and carried forward, to meet State Standard 7);
 - Action Worksheets for a minimum of two (2) proposed mitigation activities (to meet State Standard 7).

7. Develop Mitigation Actions

Projects that are well developed and documented in one place are more quickly identifiable for selection when grants become available, making implementation that much more likely.

Within each jurisdictional annex, jurisdictions must develop projects to include all information requested in the NYS DHSES Proposed Project Tables and provide a minimum of two (2) worksheets for the jurisdiction's highest priority projects.

- The plan must document all mitigation projects that have reasonable potential to be accomplished within the lifespan of the plan (five years) to include all information requested in the NYS DHSES Proposed Project Tables.
- The plan must include at least two (2) NYS DHSES Action Worksheet for the jurisdiction's highest priority projects. For jurisdictions containing an SFHA, one (1) of these Action Worksheets must be for a project that addresses flooding.

8. Identify Funding Sources

Identifying strategic funding sources is integral to successful coordination and implementation of mitigation actions.

• The plan must include a list of potential local, State and Federal funding sources.

9. Plan for Climate Change

Acknowledging and planning for climate change protects residents, avoids or reduces damage to property and public infrastructure, and reduces personal hardship.

The county and its municipalities must assess how climate change may affect vulnerability to the increased/decreased frequency of occurrence and/or severity of hazards due to climate change.

- The plan must document the assessment how climate change may affect the following hazards (at a minimum): flooding, wildfire, drought and extreme temperatures.
- The plan must document strategies and/or projects to address the above hazards as they specifically relate to climate change.
- For coastal jurisdictions, the plan must discuss sea level rise and its potential impacts.

10. Post Draft Plan Online

Allowing the public to comment on the draft plan increases awareness about how mitigation saves lives and reduces risk, and allows a final opportunity for public input.

The public must have an opportunity to view and comment on the draft plan prior to submittal.

 The draft plan must be posted in full (with the exception of discretionary sensitive information) on an existing county/jurisdiction website, or one created for the purpose of soliciting comments, for 30 days or the time prescribed by local law, whichever is greater. The website must clearly identify how the public can comment on the plan, to include either specific contact information to send comments or a user-friendly form or survey.

After NYS DHSES and FEMA Approval

- Once designated Approvable Pending Adoption (APA) by FEMA, the final plan must be placed on the same website (cited above) in its entirety (with the exception of discretionary sensitive information).
- Final payment will occur only after 50% of the participating jurisdictions have adopted the FEMA-approved plan and provided adoption resolutions to NYS DHSES. For county-led hazard mitigation planning efforts, the county must be one of the adopting jurisdictions.

The chart below shows the requirements as they appear on the plan review tool used by NYS DHSES and FEMA Region II to determine whether or not a submitted plan meets federal and state requirements.

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Not Met Met
ELEMENT F. ADDITIONAL STATE REQUIREMENTS – NYS D	HSES HAZARD MITIGATIO	N PLANNING
STANDARDS.		
These are required actions for plans developed with	NYS DHSES-administered	funds.
F1. Does the plan document how stakeholders were invited to		
participate at each phase of the planning process and provide a		
summary of feedback?		
F2. Do jurisdictions identify critical facilities, assess		
vulnerabilities and ensure protection to a 500-year flood event		
or worst case scenario?		
F3. Do jurisdictions containing an SFHA identify:		
a. potential sites for the placement of temporary housing		
units for residents displaced by disaster; and		
b. potential sites within the jurisdiction suitable for		
relocating houses out of the floodplain, or building new		
houses once properties in the floodplain are razed?		
F4. Do jurisdictions identify:		
 routes and procedures to evacuate citizens prior to and during an event; and 		
b. shelters for evacuated citizens, to include provisions for		
a range of medical needs, accommodation for pets,		
and compliance with the Americans with Disabilities		
Act (www.ada.gov)?		
F5. Do jurisdictions identify mitigation projects completed since		
the approval of the previous mitigation plan (or within the last		
five years)?		
F6. Does the plan include an annex for every jurisdiction within		
the County's boundaries?		
F7. Within each jurisdictional annex, are:		
a. projects developed in accordance with the NYS		
DHSES Proposed Projects Table; and		
b. two (2) NYS DHSES Action Worksheets provided?		
F8. Does the plan include a list of potential funding sources?		
F9. Does the plan assess how climate change may affect		
vulnerability to hazards, propose actions to address this, and		
discuss sea level rise (if applicable)?		
F10. Was the draft plan posted for public comment?		
Note: The applicant is required to address the 2016 NYS DHSE		
as required actions for a hazard mitigation plan developed	with funds administered by	NYS DHSES.

ELEMENT F: REQUIRED REVISIONS

Please see opportunities for improvement

New York State

Hazard Mitigation Planning Standards Guide

Prepared as supplemental guidance to support the development of Multi-jursidictional Hazard Mitigation Plans to meet the New York State Planning Standards.

Please note:

Jurisdiction is used to describe all government entities within the boundaries set forth in the Multi-Jurisdictional Plan (typically County-wide), including the County itself, as well as cities, towns, villages and tribal entities.

Special Flood Hazard Area (SFHA) is defined as the area that will be inundated by the flood event having a 1-percent change of being equaled or exceeded in a given year (also known as the 100-year flood event).

2017 New York State Hazard Mitigation Planning Standards Guide

1. Establish Jurisdictional Teams

Plans developed with the participation of the widest range of organizations and stakeholders personally familiar with past damages to local infrastructure are likely to contain valuable, relevant information that will lead to a comprehensive plan and feasible projects.

During initial stages of development, jurisdictions should identify organizations and key stakeholders in order to develop individual jurisdictional teams. Once jurisdictional teams are established, all members should be invited at every stage of the process.

Jurisdictions must invite key stakeholders when initiating the planning process and identifying mitigation strategies. At a minimum (if applicable), this should include:

- County Hazard Mitigation Coordinator
- County Floodplain Administrator (or person acting as such)
- County Emergency Managers
- County Planners
- County GIS staff
- County Soil & Water Conservation Districts
- Elected and executive officials
- Regional & Metropolitan (Transportation) Planning
 Organizations
- Statewide/Local Watershed Commissions
- Educational Representation (Schools/Universities)
- Economic Development/Chamber of Commerce

- Local Hazard Mitigation Coordinators and Floodplain Managers
- Local Code Enforcement Officials
- First Responder Organizations
- Local Emergency Planning Committees (LEPC)
- Local Emergency Management
- Local Planners and planning consultants
- Local Engineers and engineering consultants
- Local Public Works or Highway Superintendents
- Health Care
- Neighboring Counties
- Utilities (gas, electric, water)

The plan must present information to show that such persons were included in the process. Examples:

- Copies of electronic or hard copy meeting invitations.
- A list of persons invited, their position, the jurisdiction represented and if they participated.
- Meeting sign-in sheets, minutes or other documentation showing specific activity in which the identified persons participated, and how their input was included in the plan.

Plans developed with the participation of a wide range of organizations and stakeholders are the most likely to contain viable, innovative or useful projects and project data, as they each bring unique perspectives to the table:

- *Elected and executive officials* have an understanding of overall jurisdiction needs and are able to communicate how the mitigation plan can support social, economic, or environmental conditions.
- Local planners can help the jurisdiction understand past, current, and future jurisdiction development trends, policies or activities that affect development, how development affects vulnerability to hazards, and how hazard mitigation can be incorporated into various planning mechanisms.
- *Emergency Managers and first responders* have information on past occurrences and existing preparedness measures, and have a direct line of communication with the NYS DHSES.
- Geographic Information System (GIS) specialists can analyze and map data to support the planning process and communicate complex information, such as the locations of assets at risk in hazard prone areas and estimates of damage for a particular disaster scenario. This might be done in consultation with County GIS staff.
- *Floodplain administrators* provide information on local flood hazard maps, floodplain ordinance, repetitive loss properties, and actions to continue compliance with the National Flood Insurance Program and reduce flood losses.
- *Public works staff* can help identify current or projected problems for the jurisdictions' infrastructure that can be addressed through capital improvements supported by the mitigation plan.

For more guidance on stakeholder identification, see: <u>Mitigation Guide - Worksheet 2.1</u> The following table provides an example of how the plan might document the identification and invitation of key stakeholders for each jurisdiction.

Insert Jurisdiction's Name Here

Individuals Notified of the Mitigation Plan Development and Invited to Participate

Local Jurisdiction Role/Position	Name of Person Invited	Email of Person Invited	Date of Invitation	Method of Invitation	Agreed to participate? yes/no	Feedback Provided? Yes/no
Land Use/ Jurisdiction Planner						
Emergency Manager						
Floodplain Manager/ Administrator						
Public Works Director/ City Engineer						
Building Code Official						
Fiscal/Budget Officer						
Elected Officials						
Local Hospital						
Major University						
Significant Business						
Neighboring County 1						
Neighboring County 2						
Tribal Nation						
Example	George Washington	gwashington@town.gov	12/12/14	Email and letter sent	Yes	Yes

2. Assess Critical Facilities

Critical facilities must remain accessible and functional before, during and after disasters to meet the jurisdiction's Continuity of Government (COG) and Continuity of Operations (COOP) standards, and to support emergency, government and sheltering functions.

Identifying Critical Facilities: Federal Guidelines (FEMA)

FEMA defines a critical facility as one that provides services and functions essential to a community, especially during and after a disaster. More information can be found on the agency web site at https://www.fema.gov/critical-facility. Examples of critical facilities include:

- Police stations
- Fire stations
- Critical vehicle and equipment storage facilities
- Emergency Operations Centers
- Utilities and power generating stations
- Communication centers
- Medical facilities, including hospitals, nursing homes, blood banks, and health care facilities
- Schools and day care centers, especially if designated as a disaster shelter
- Public and private utility facilities

- Drinking water and wastewater treatment plants
- Drug and alcohol treatment custodial care programs
- Homeless shelters
- Tier 2 facilities: Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or waterreactive materials; facilities designed for bulk storage of chemicals, petrochemicals, hazardous or toxic substances, or floatable materials (as defined by NYS DEC)

Jurisdictions may also want to analyze risks to major employers and assess the economic impact of prolonged down-time due to disasters.

Identifying Critical Facilities: State Guidelines (NYS DEC and NYS DHSES)

New York Department of Environmental Conservation (DEC) Statute 6 CRR-NY 502.4 sets forth floodplain management criteria for State projects located in flood hazard areas. The law states that no such projects related to critical facilities shall be undertaken in a Special Flood Hazard Area (SFHA) unless constructed according to specific mitigation specifications, including being raised 2' above the Base Flood Elevation (BFE). This statute is outlined at http://tinyurl.com/6-CRR-NY-502-4.

Protecting Critical Facilities

In assessing vulnerabilities to critical facilities, jurisdictions must identify exposure to hazards and propose methods to mitigate risks. This can be accomplished through a table, or with GIS overlay maps specific to hazards of concern.

FEMA provides the following recommendations for protecting infrastructure and critical facilities from damage:

- Incorporate hazard mitigation principles into all aspects of publicly-funded development;
- Incorporate mitigation retrofits for public facilities into the annual capital improvements program;
- Engineer or retrofit roads and bridges to withstand hazards and ensure access;
- Relocate or underground electrical infrastructure;
- Design and build water tanks or wells for use in times of potable water interruption;
- Install quick-connect emergency generator hook-ups for critical facilities.

While all vulnerabilities should be assessed and documented, the State places a high priority on exposure to flooding. Critical facilities located in an SFHA, or having ever sustained previous flooding, must be protected to the 500-year flood even, or worst damage scenario. For those that do not meet this criteria, the jurisdiction must identify an action to achieve this level of protection.

For at-risk facilities that are not owned by or the responsibility of the jurisdiction, the jurisdiction should include an action to work with the responsible party to develop a mitigation strategy

3. Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

Intermediate Needs – Temporary Housing

The jurisdiction must identify sites for the placement of temporary housing units to house residents displaced by disaster. While sites can be coordinated county wide, it is critical that each jurisdiction identify a site. Residents may be accommodated by a temporary housing location that is outside of the jurisdiction in which they live as long as mutual aid agreements between municipalities are in place.

Examples of potential locations include existing mobile home parks; recreational vehicle/camping grounds; public or private land or parkland; or a site easily convertible for the placement of temporary housing units. Such sites must:

- Be compliant with the New York State Uniform Fire Prevention and Building Code <u>http://www.dos.ny.gov/cnsl/lg03.htm;</u>
- Be constructed with a first-floor elevation placed no less than 2' above the Base Flood Elevation (i.e., of the 100-year flood level);
- If located in a neighboring jurisdiction, include discussion about plans with residents and ensure procedures are consistent with local mitigation and emergency plans, recovery plans, evacuation routes, etc.;
- Consider water, wastewater, electrical and firefighting accessibility.

Long-term Needs – Permanent Housing

Structures located in the SFHA may need to be relocated, or new properties must be built once severely damaged properties are razed. Jurisdictions must identify all suitable sites currently owned by the jurisdiction, and potential sites under private ownership that meet applicable local zoning requirements and floodplain laws.

Consideration should be given to allowing residents of a given jurisdiction to continue to reside there. However, discussion of this matter may need to include site development elsewhere if such available locations are not available in a given jurisdiction.

4. Plan for Evacuation Needs and Sheltering

Evacuation and sheltering measures must be in place and available for public awareness to protect residents and mitigate risk, stress and personal hardships during hazard events

A jurisdiction's existing Comprehensive Emergency Management Plan (CEMP) or other plans, policies and procedures may outline evacuation routes and procedures to remove citizens from a vulnerable location prior to and during an incident. If plans for evacuation and sheltering are already in place, the mitigation planning jurisdiction should analyze and update these materials as needed. The plan must refer to this information and include the URL of where it can be found on the county web site.

If such plans do not exist, they must be developed and:

- Identify evacuation routes and how this information is accessible to the public;
- Identify shelters for evacuated citizens and how this information is accessible to the public leading up to and during an incident;
- Explain provisions available to address medical needs, access and functional needs, accommodation for pets, and compliance with the Americans with Disabilities Act (see www.ada.gov);
- Outline pre-disaster actions required to make evacuation and shelter plans viable;
- Document evidence of coordination with adjoining jurisdictions (if applicable).

The plan should address jurisdictions with residential neighborhoods and critical facilities that have been flooded, inundated, or isolated by water.

5. Document Past Mitigation Accomplishments

Past mitigation actions provide a context for the jurisdiction's projects, and can help to evaluate accuracy of assumptions to support future mitigation planning.

FEMA Element D2 (see FEMA Local Mitigation Plan Review Guide, page 27) requires a progress update on local mitigation efforts and changes in priorities since the approval of the previous plan. NYS DHSES requirement F5 requires the documentation of local mitigation efforts and accomplishments within the past five (5) years for new plans as well as updates, regardless of inclusion in the previous plan, and regardless of funding source.

The goal is to provide a context for the jurisdictions' projects, act as a source of ideas for mitigation projects and evaluate the accuracy of assumptions and engineering solutions to inform future projects, and to support future mitigation planning and its coordination with other planning, zoning and environmental procedures within the jurisdiction.

It is recommended that a table be included within each jurisdictional annex to convey this information.

The following table provides an example of how the plan might include this information within each jurisdictional annex:

Insert Jurisdiction's Name Here Past Mitigation Accomplishments

Proj #	Project Name	Hazard Addressed	Brief Summary of the Original Problem and the Solution (Project)	Evaluat	tion of Success
				Cost	
				Level of Protection	
				Damages Avoided; Evidence of Success	
				Cost Level of Protection	
				Damages Avoided; Evidence of Success	
				Cost Level of Protection Damages Avoided; Evidence of Success	

Other resources and ideas for documentation can be found at: <u>http://mitigationguide.org/wp-content/uploads/2013/05/Worksheet-7.1.pdf?_sm_au_=iVVnVbMZWRTNJKqj</u>.

6. Include Jurisdictional Annexes

Jurisdictional annexes provide a unique, stand-alone guide to mitigation planning for each jurisdiction.

Multi-jurisdictional Hazard Mitigation Plans allow certain elements of the planning process to be streamlined and shared, taking some of the burden of effort and cost off of each jurisdiction. The goal is to develop a shared portion of the plan that relates to the multiple jurisdictions therein from a county wide perspective, while also developing individual jurisdictional annexes to identify the unique local risks and mitigation strategies.

Identify Jurisdictional Participation

Every jurisdiction within the county's borders should be included in this multi-jurisdictional plan, including the county itself. Efforts to participate should be included for all jurisdictions, including those that did not fully participate and are therefore not seeking FEMA/NYS DHSES approval at the time of submittal.

The plan must clearly identify all jurisdictions and whether or not they are seeking approval for adoption from FEMA and NYS DHSES.

The following table provides an example of how the plan might include this information in the introduction section:

Jurisdiction	Letter of Commitment to Planning Process	Attended Planning Meetings	Provided Update on Past Projects	Submitted Mitigation Actions for Current Plan	Seeking Approval for Adoption (Meets all previous requirements)
Howard County	x	x	x	x	x
Aubrey, City	x	x		х	
Easterville, Town	x	x		х	
Easterville, Village	x	х	x	х	×
Louden, Town	x	х	x	х	x
Ontario, Village					
Pasadena, City	x			х	
Scupper, Town	x	х	x	х	x
Yardley, Village	x	x		x	

XXX County Jurisdictions

Letters of Commitment to Planning Process establishes a commitment from and a cooperative working relationship between all participating jurisdictions in the development and implementation of the plan. <u>http://mitigationguide.org/wp-content/uploads/2013/05/Worksheet-1.2.pdf</u>

Attending Planning Meetings is a critical component of participation which facilitates group discussion and allows for a greater perspective of how jurisdictions can work together to further mitigation efforts.

Jurisdictions must *Provide an Update on Past Projects* to help evaluate past efforts and inform future planning.

Jurisdictions must **Submit Mitigation Actions for the Current Plan** to establish priorities and make successful implementation as likely as possible.

In order to Seek Approval for Adoption, jurisdictions must meet all Federal requirements.

Provide Jurisdictional Information

The plan must be organized to include an annex for every jurisdiction. Non-participating jurisdictions must have an annex included in the plan, with as much of the information noted below that is available, as a placeholder to allow for future participation.

Each jurisdictional annex must include the following information:

- Contact Information;
 - o Name, Title, Phone Number, Address, Email Address;
 - o If alternate contact information is available, this should be included as well.
- Jurisdiction Profile;
 - For example: population, land size, demographics, topography, brief history, governing body format.
- Hazard Identification;
 - Hazard Identification and Risk Assessment occurs in the county wide shared plan. The jurisdictional annex should identify only those hazards that are unique and specific to the jurisdiction.
- Summary of Unique Hazard Event History/Impact on jurisdiction;
 - A complete Hazard Event History will be included in the county wide shared plan. The jurisdictional annex should be a discretionary list of events that have had particular impact on the jurisdiction, and therefore inform the unique mitigation strategies developed to address.
- National Flood Insurance Program (NFIP) Summary (to meet Federal Standards);
- Critical Facilities Information (to meet State Standard F2);
- Public involvement;
 - Jurisdictional annexes should identify any specific problems, solutions or ideas brought to the planning process from the public or local authorities; if this is done holistically at the County level, this can be included only in the County annex.
- Capabilities Assessment;
- Mitigation Strategy;
 - All identified previous mitigation activities with current status;
 - Previous mitigation activities completed (to meet State Standard F5);
 - All proposed mitigation activities (both new and carried forward, to meet State Standard F7);
 - Action Worksheets for a minimum of two (2) proposed mitigation activities (to meet State Standard 7).

7. Develop Mitigation Actions

Projects that are well developed and documented in one place are more quickly identifiable for selection when grants become available, making implementation that much more likely.

List all proposed mitigation activities

The plan must include a single complete list of mitigation projects in each jurisdictional annex. While all mitigation projects on a jurisdiction's wish list should be assessed and discussed, only those that have reasonable potential to be accomplished within the lifespan of the plan should be included. The capabilities and resources of a given jurisdiction should be taken into consideration when establishing its wish list. Projects should be prioritized according to jurisdiction need and focus on achievable efforts. The project list should include those that may not meet FEMA eligibility or cost-effectiveness requirements since funding should be sought from multiple sources to achieve a jurisdiction's mitigation goals most quickly.

The information requested in the NYS DHSES Proposed Project Table on the following page must be provided within the plan.

- Project Name and Number;
- Goal and/or Objective being met;
- Hazard to be mitigated;
- Description of the Problem;
- Description of the Solution (Project Description);
- Whether or not the project is related to a Critical Facility (and if so, assurance that the facility will be protected to the 500-year event or greatest damage scenario, to meet State Standard F2);
- Estimated Timeline;
- Lead Agency responsible for implementation;
- · Estimated Costs;
- Estimated Benefits;
- Potential Funding Sources;
- Priority.

Complete a NYS DHSES Action Worksheet for a minimum of two projects

If a proposed mitigation project is viable and a priority to the jurisdiction, consideration should be given to the elements required to successfully implement. This provides the jurisdiction with a more developed starting point for implementation should funding become available or priorities dictate urgency. This also provides a guide for NYS DHSES to assess a county or jurisdiction's needs and quickly identifies eligible projects for funding should grants become available at the state level.

For mitigation activity ideas and suggestions, see: <u>https://www.fema.gov/media-library-data/20130726-1904-25045-0186/fema_mitigation_ideas_final508.pdf</u>

While we recommend further consideration be given to all proposed actions by completing a NYS DHSES Action Worksheet, each jurisdiction must complete a minimum of two (2) NYS DHSES Action Worksheets for the jurisdiction's highest priority projects. For jurisdictions containing a Special Flood Hazard Area, one (1) of these Action Worksheets must be for a project that addresses flooding.

DHSES administers three mitigation grant programs: the Hazard Mitigation Grant Program (HMGP) rolled out after a declared disaster in NYS, and the annual Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) programs. Letters of Intent (LOIs) for projects more fully developed in the NYS DHSES Action Worksheets will rank higher and will be prioritized for funding over those that are not.

The NYS DHSES Action Worksheet can be found on page 12, with subsequent guidance. This Worksheet will be made available for completion in electronic format as well.

	PROPOSED PROJECTS *Projects related to Critical Facilities (CF) will protect the facility to the 500-year event or worst damage scenario, whichever is greater.												
											¥		
Proj	Project	Goal/	Hazard to	Description of	Description of	CF?*	EHP Issues	Estimated	Lead	Estimated Costs	Estimated	Potential	Priority
#	Name	Objective	be	the Problem	the Solution			Timeline	Agency		Benefits	Funding	
		being	Mitigated									Sources	
		Met											
ł													

The use of this table is not a requirement, but may be used as a starting point to develop actions that must provide:

- Project Name and Number;
 - This should be a unique identifier for the project. If the project was included in a previous plan and is being carried over, the identifier should be consistent or the previous one referenced.
- Goal and/or Objective being met;
 - The project must be consistent with a goal and/or objective identified in the plan.
- Hazard to be mitigated;
 - Identify the Hazard to be mitigated.
- Description of the Problem;
 - Provide a brief description of hazard's impact to the community, both previous damages and/or potential damages.
- Description of the Solution (Project Description);
 - Provide a brief description of the proposed project, including location, scope of work of mitigation action (including studies/assessments required or already performed), and any known environmental or historic preservation concerns that may arise upon implementation.
- Whether or not the project is related to a Critical Facility;
 - Is this project related to a critical facility? Yes/No. As sampled above, it must be noted that any project related to a critical facility must
 assure that the facility will be protected to the 500-year event or greatest damage scenario, to meet State Standard F2.
- Estimated Timeline;
 - o Identify the time required for completion of the project upon implementation.
- Lead Agency responsible for implementation;
 - o Identify the lead agency or department responsible for implementation.
- Estimated Costs;
 - Provide an estimated cost for implementation. Rough dollar figures are ideal, but if unknown, a specified range is acceptable.
- Estimated Benefits;
 - Provide a description of the estimated benefits, either quantitative and/or qualitative.
- Potential Funding Sources;
 - o Identify potential funding sources for implementation, which will be supported by a list as required in State Standard F8; and
- Priority.
 - o Identify the prioritization of this project as determined by a methodology established by the community.

XXXXXXX County Multi-Jurisdictional Hazard Mitigation Plan

	(Name of J		
	NYS DHSES A	ction Worksheet	
Project Name:			
Project Number:			
	Risk / Vul	Inerability	
Hazard of Concern:			
Description of the Problem:			
	Action or Project Inten	ded for Implementation	
		*	
Description of the Solution:			
Is this projec	ct related to a Critical Facility?	Yes 🗌	No 🗌
(If yes, this proje	ect must intend to protect to the 500-year flood	event or the actual worst damage sc	cenario, whichever is greater.)
Level of Protection:			
Useful Life:		Estimated Benefits (losses avoided):	
Estimated Cost:		(losses avolueu).	
	Plan for Imj	plementation	
Prioritization:		Desired Timeframe for Implementation:	
Estimated Time Required for Project Implementation:		Potential Funding Sources:	
Responsible Organization:		Local Planning Mechanisms to be Used in Implementation, if any:	
	Three Alternatives Consid	ered (including No Action)	
	Action	Estimated Cost	Evaluation
	No Action	\$0	
Alternatives:			
	Progress Report (fo	r plan maintenance)	
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

XXXXXXX County Multi-Jurisdictional Hazard Mitigation Plan

	(Name of	Jurisdiction)					
		ction Worksheet					
Project Name:	Each action must have a unique project num	ber referenced here and in the Actio	n Tables.				
Project Number:	Each action must have a unique project name referenced here and in the Action Tables.						
	Risk / Vu	ılnerability					
Hazard of Concern:	Identify the hazard being addressed with this	s action.					
Description of the Problem:	Provide a detailed narrative of the problem. jurisdiction, past damages and loss of service applicable), adjacent streets, and easily ident with a brief description of existing condition	e, etc. Include the street address of ified landmarks such as water bodie	the property/project location (if es and well-known structures, and end				
	Action or Project Inter	nded for Implementation					
Description of the Solution:	Provide a detailed narrative of the solution. work and by the project's effects; how the ac proposed construction methods, including ar development process (e.g., are studies and/or (attach any reports or studies).	tion would address the existing con y excavation and earth-moving acti	ditions previously identified; vities; where you are in the				
Is this proje	ct related to a Critical Facility?	Yes	No 🗖				
(If yes, this proje	ect must intend to protect to the 500-year flood	event or the actual worst damage se	cenario, whichever is greater.)				
Level of Protection:	Identify the level of protection the proposed project will provide. Ex. 100- year (1%) flood.	Estimated Benefits	Identify the benefits that implementation of this project will provide. If dollar amounts are				
Useful Life:	Identify the number of years the project will provide protection against the hazard.	(losses avoided):	known, include them. If dollar amounts are unknown or are unquantifiable, describe the losses				
Estimated Cost:	Identify all estimated costs associated with implementation.		that will be avoided.				
		plementation					
Prioritization:	Identify the priority based on the prioritization method agreed upon.	Desired Timeframe for Implementation:	Identify the desired start time for this project. Ex. Within 6 months.				
Estimated Time Required for Project Implementation:	Provided the estimated time required to complete the project from start to end.	Potential Funding Sources:	Multiple sources of potential funding should be listed when appropriate.				
Responsible Organization:	Identify the name of a department or agency responsible for implementation, not the jurisdiction.	Local Planning Mechanisms to be Used in Implementation, if any:	Consider the use of local planning mechanisms that will be used to implement this project.				
	Three Alternatives Consi	dered (including No Action)					
	Action	Estimated Cost	Evaluation				
	No Action	\$0					
Alternatives:	Alternative 1 – Brief Description		Include a description of pros/cons of Alternative 1.				
	Alternative 2 – Brief Description		Include a description of pros/cons of Alternative 2.				
	Progress Report (f	or plan maintenance)					
Date of Status Report:	This section should be completed during pla	n maintenance/evaluation.					
Report of Progress:	Describe what progress, if any, has been made on this project. If it has been determined the jurisdiction no longer wishes to pursue implementation, state that here and indicate why.						
Update Evaluation of the Problem and/or Solution:	Provide an updated description of the proble consideration/development.	m and solution, and what has happe	ned since initial				

8. Identify Funding Sources

Identifying strategic funding sources is integral to successful coordination and implementation of mitigation actions

The list of potential funding sources must include a brief description of each funding program and a link to the web pages describing the funding opportunity.

Section 4 Table 4.5h of the NYS Hazard Mitigation Plan provides an example of how to document sources and can be used as a starting point to identify potential funding sources as applicable to the county. The jurisdiction is also expected to research and identify additional funding opportunities.

http://www.dhses.ny.gov/recovery/mitigation/documents/2014-shmp/Section-4-Mitigation-Strategy.pdf

9. Plan for Climate Change

Acknowledging and planning for climate change protects residents, avoids or reduces damage to property and public infrastructure, and reduces personal hardship.

Plans developed with NYS DHSES-administered funds must include this information as part of the hazard vulnerability analysis and contain strategies/projects to address increased vulnerability that may result from climate change. This requirement was established to encourage jurisdictions to plan for and accommodate climate change and sea level rise. By developing mitigating strategies and/or projects for hazards that are exacerbated by climate change, jurisdictions will better protect residents, avoid or reduce damage to property and public infrastructure, and reduce personal hardship.

Jurisdictions must consider how climate change may affect their vulnerability or increased frequency of occurrence and/or severity in exposure to flooding, wildfire, drought and extreme temperatures.

Jurisdictions with coastal property must also analyze their vulnerability to sea level rise.

Numerous resources are available to the mitigation planning committee, including the following:

Resource: Description:	NY State 2014 Hazard Mitigation Plan: Section 3.4 – Climate Change Climate Change was first discussed in the 2011 NYS mitigation plan and expanded in 2014
	update. The Climate Change section highlights current initiatives and reports on adaptation strategies being developed by the state.
Location:	http://www.dhses.ny.gov/recovery/mitigation/plan.cfm
Resource: Description:	Responding to Climate Change in New York State (ClimAID) – 2014 Update ClimAID is a climate analysis of the seven regions of New York State. The report, produced by the NYS Energy Research and Development Authority (NYSERDA), builds on data released in 2014 by the worldwide Intergovernmental Panel on Climate Change.
Location:	https://www.nyserda.ny.gov/climaid
Resource: Description:	New York Climate Change Science Clearinghouse The Clearinghouse is a gateway for policymakers, local planners, and the public to identify and access documents, data, websites, tools, and maps relevant to climate change adaptation and mitigation across New York State. The goal of the NYCCSC is to support scientifically sound and cost-effective decision-making. The vision is a dynamic site where users can find information in multiple ways, including through interactive tools that use data from different sources.
	https://www.pvelimatecelence.org/
Location:	https://www.nyclimatescience.org/
Resource:	https://www.nyclimatescience.org/ FEMA: Climate Resilient Mitigation Activities
Resource:	FEMA: <i>Climate Resilient Mitigation Activities</i> FEMA provides fact sheets, job aids and cost-benefit analysis tools to support community efforts to reduce the risk associated with climate change. Climate Resilient Mitigation Activities are eligible for Hazard Mitigation Grant Program funding available following a major disaster; and for competitive grants under the annual Pre-Disaster Mitigation and Flood Mitigation Assistance
Resource: Description:	FEMA: <i>Climate Resilient Mitigation Activities</i> FEMA provides fact sheets, job aids and cost-benefit analysis tools to support community efforts to reduce the risk associated with climate change. Climate Resilient Mitigation Activities are eligible for Hazard Mitigation Grant Program funding available following a major disaster; and for competitive grants under the annual Pre-Disaster Mitigation and Flood Mitigation Assistance programs.
Resource: Description: Location:	 FEMA: Climate Resilient Mitigation Activities FEMA provides fact sheets, job aids and cost-benefit analysis tools to support community efforts to reduce the risk associated with climate change. Climate Resilient Mitigation Activities are eligible for Hazard Mitigation Grant Program funding available following a major disaster; and for competitive grants under the annual Pre-Disaster Mitigation and Flood Mitigation Assistance programs. https://www.fema.gov/climate-resilient-mitigation-activities-hazard-mitigation-assistance NYS Climate Smart Communities Climate Smart Resiliency Planning: A Planning Evaluation



APPENDIX J. LINKAGE PROCEDURES

This Appendix contains the linkage procedures for the Monroe County Hazard Mitigation Plan.





J.1 ADMINISTRATIVE PROCESS FOR "LINKAGE" TO THE MONROE COUNTY HAZARD MITIGATION PLAN

The development of the Monroe County Hazard Mitigation Plan 2023 Update (the Plan) included the County and all eligible local governments within the defined planning area are included in this plan. Completed jurisdictional annexes are presented in Section 9. Any non-participating local jurisdictions such as Fire Districts, Utility Districts, School Districts and any other eligible local government as defined in 44 CFR 201.2 within the Monroe County planning area can join this plan as a participating jurisdiction and to ultimately achieve approved status by following the linkage procedures defined in this appendix.

It is assumed that some or all of these local jurisdictions may choose to "link" to the Plan at some point in time to gain eligibility for programs under the DMA. In addition, some of the current partnership may not continue to meet eligibility requirements due to the lack of active participation as prescribed by the plan. These "linkage" procedures will define the requirements established by the Monroe County HMP Steering Committee and all planning partners for dealing with the increase or decrease in planning partners linked to this plan. It should be noted that currently non-participating jurisdictions within the defined planning area are not obligated to link to this plan. These jurisdictions can choose to do their own "complete" plan that addresses all required elements of section 201.6 of 44CFR.

J.1.1 Increasing the Partnership Through Linkage

Eligibility

Eligible jurisdictions located in the planning area may link to this plan at any point during the plan's performance period. Eligible jurisdictions located in the planning area may link to this plan at any point during the plan's performance period (5 years after final approval). Eligibility will be determined by the following factors:

- The linking jurisdiction is a local government as defined by the Disaster Mitigation Act.
- The boundaries or service area of the linking jurisdiction is completely contained within the boundaries of the planning area established during the 2023 hazard mitigation plan development process.
- The linking jurisdiction's critical facilities were included in the critical facility and infrastructure risk assessment completed during the 2023 plan development process.

Requirements

It is expected that linking jurisdictions will complete the requirements outlined below and submit their completed template to the lead agency Monroe County Office of Emergency Management for review within six months of beginning the linkage process:

- 1. The Monroe County Hazard HMP Steering Committee has established an annual window for which linkage to the plan can occur. Linking jurisdictions are instructed to complete the following procedures during this time frame.
- 2. The current non-participating jurisdiction contacts the Monroe County HMP Coordinator for the Plan and requests a "Linkage Package". The Monroe County HMP Coordinator is:

Timothy Henry, Office of Emergency Management Monroe County Department of Public Safety 1190 Scottsville Road, Suite 200 Rochester, NY 14624





(585) 753-3816 Email: timhenry@monroecounty.gov

- 3. The Monroe County HMP Coordinator will provide a linkage packages that includes:
 - Copy of Volume 1 and 2 of the Plan (CDROM).
 - Planning Partner's Expectations Sheet.
 - A Sample "Letter of Intent" to Link to the Plan.
 - A Jurisdictional Template and Instructions.
 - Catalog of Hazard Mitigation Alternatives or the Mitigation Catalog.
 - A copy of Section 201.6 of Chapter 44, the Code of Federal Regulations (44CFR), which defines the federal requirements for a local hazard mitigation plan.
- 4. The new jurisdiction will be required to review both volumes of the Plan which includes the following key components for the planning area:
 - The Monroe County risk assessment;
 - The plan's goals and objectives;
 - Plan implementation and maintenance procedures;
 - Catalog of potential mitigation actions; and
 - County-wide initiatives.

Once this review is complete, the jurisdiction will complete its specific jurisdictional annex by following the template and its instructions for completion provided by the Monroe County HMP Coordinator. Technical assistance can be provided upon request by completing the request for technical assistance (TA) form provided in the linkage package. This TA may be provided by the Monroe County HMP Coordinator or any other resource within the Planning Partnership such as a member of the HMP Steering Committee or a currently participating jurisdiction. The Monroe County HMP Coordinator will determine who will provide the TA and the possible level of TA based on resources available at the time of the request.

5. The new jurisdiction will also be required to develop a public involvement strategy that ensures their public's ability to participate in the plan development process. At a minimum, the new jurisdiction must make an attempt to solicit public opinion on hazard mitigation at the onset of this linkage process and a minimum of one public meeting to present their draft jurisdiction specific annex for comment, prior to adoption by the governing body. The Planning Partnership will have available resources to aid in the public involvement strategy such as the Plan website. However, it will be the new jurisdiction's responsibility to implement and document this strategy for incorporation into their annex.

It should be noted that the Jurisdictional Annex templates do not include a section for the description of the public process. This is because the original partnership was covered under a uniform public involvement strategy that covered the operational area that is described in Volume 1 of the plan. Since the new partner was not addressed by that strategy, they will have to initiate a new strategy, and add a description of that strategy to their annex. For consistency, new partners are encouraged to follow the public involvement format utilized by the initial planning effort as described in Volume I of the Plan.

6. Once their public involvement strategy is completed and they have completed their template, the new jurisdiction will submit the completed package to the Monroe County HMP Coordinator for a pre-adoption review to ensure conformance with the regional plan format.





- 7. The Monroe County HMP Coordinator will review for the following:
 - Documentation of public involvement and mitigation action development strategies;
 - Conformance of template entries with guidelines outlined in instructions;
 - Chosen actions are consistent with goals, objectives, and mitigation catalog of Monroe County Hazard Mitigation Plan; and
 - Designated point of contact.

The Monroe County HMP Coordinator may utilize members of the HMP Steering Committee or other resources to complete this review. All proposed linked annexes will be submitted to the HMP Planning Committee for their review and comment prior to submittal to the New York State Division of Homeland Security and Emergency Services (NYS DHSES).

- 8. Plans approved and accepted by the HMP Steering Committee will then be forwarded to NYS DHSES for review with cover letter stating the forwarded plan meets local approved plan standards and whether the plan is submitted with local adoption or for criteria met/plan not adopted review.
- 9. NYS DHSES will review plans for state and federal compliance. Non-compliant plans are returned to the jurisdiction for correction. Compliant plans are forwarded to FEMA Region II office for review with annotation as to the adoption status.
- 10. FEMA Region II reviews the new jurisdiction's plan in association with the approved plan to ensure DMA compliance. Region II notifies new jurisdiction of results of review with copies to NYS DHSES and approved planning authority.
- 11. New jurisdiction corrects plan's shortfalls (if necessary) and resubmits to NYS DHSES through the approved plan lead agency.
- 12. For plans with no shortfalls that have not been adopted from the Region II review or outstanding corrected shortfalls, the new jurisdiction governing authority adopts the plan (if not already accomplished) and forwards adoption resolution to Region II with copies to lead agency and NYS DHSES.
- 13. Region II Director notifies new jurisdiction governing authority of plan approval.

The new jurisdiction plan is then included with the Monroe County HMP and the linking jurisdiction is committed to participate in the ongoing plan implementation and maintenance identified in Volume 1 of the HMP.





APPENDIX K. DAM SUPPLEMENT

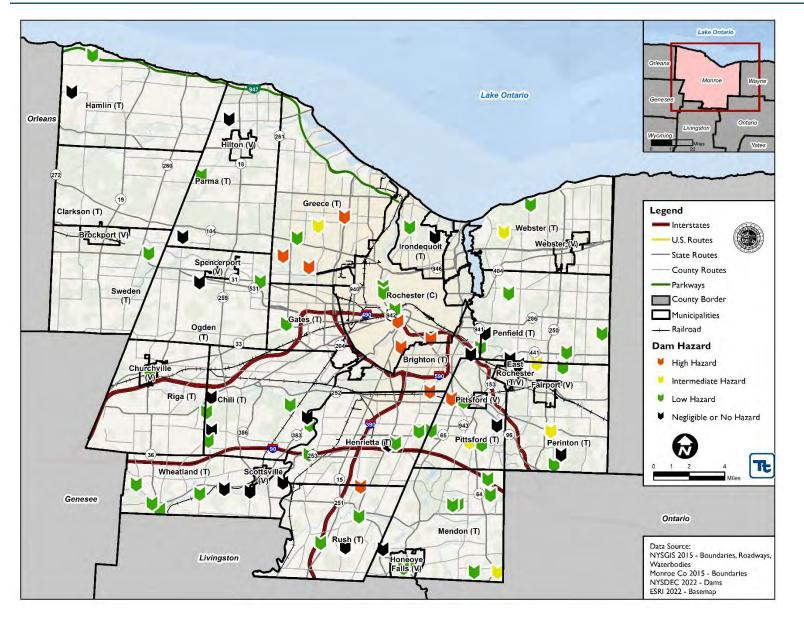
K.1 Overview

This section contains information and details to support information provided in Section 4 (County Profile) and Section 5.4.5 (Flood), which provide the distribution of dams located within Monroe County and its municipalities, along with potential impacts of high hazard dams as discussed in the Emergency Action Plans (EAP) for those dams. Due to the sensitive nature of this information, details have been redacted. Contact the HMP Coordinator, Matthew Jarrett, Office of Emergency Management at <u>mattjarrett@monroecounty.gov</u> for more information.





Figure K-1. Location of Dams in Monroe County







Location

There are 81 dams located in Monroe County (see Figure K-1). Of the 81 dams located in Monroe County, 9 are high hazard dams. These dams are located in the Town of Greece, Town of Henrietta, Town of Pittsford, City of Rochester, and Town of Rush as shown in Table K-1.

High Hazard Dam Names per Jurisdiction					
Municipality	Dam Name				
	English Road Detention Facility Dam				
Town of Greece	Larkin Creek Dam				
	Round Pond Creek Dam				
Town of Henrietta	Lock 33 Dam Monroe Canal				
Town of Pittsford	Lock 32 Dam Monroe Canal				
	Cobbs Hill Reservoir Dam				
City of Rochester	Court Street Dam				
	Highland Park Reservoir Dam				
Town of Rush	Rush Reservoir Dam				

Table K-1. High Hazard Dams in Monroe County

Source: NYS DEC 2022

Monroe County can also be impacted by dam failure from dams located in neighboring counties. Of the potential dams that could impact the County, the most concern during the planning process centered around Mount Morris Dam. Mount Morris Dam is a high hazard dam located in neighboring Livingston County. Failure of the dam would impact Monroe County and potentially threaten life and property. Monroe County has limited information on the dam. Monroe County has identified a mitigation action to partner with Livingston County to gather information on dam failure inundation zones, collaborate for dam failure warning systems, and coordinate emergency planning.

To fully assess Monroe County's risk to dam failure, a quantitative review would need implemented utilizing the probable maximum flood inundation areas. For this planning process, these dam failure inundation areas were unavailable. As an additional mitigation action, Monroe County OEM and DES will work with NYSDEC and dam owners to collect up to date digital versions of Emergency Action Plans and dam failure inundation mapping/data.

The following figures show the dam failure inundation maps for Round Pond Creek Dam.





Figure K-2. Round Pond Creek Dam –Inundation Map

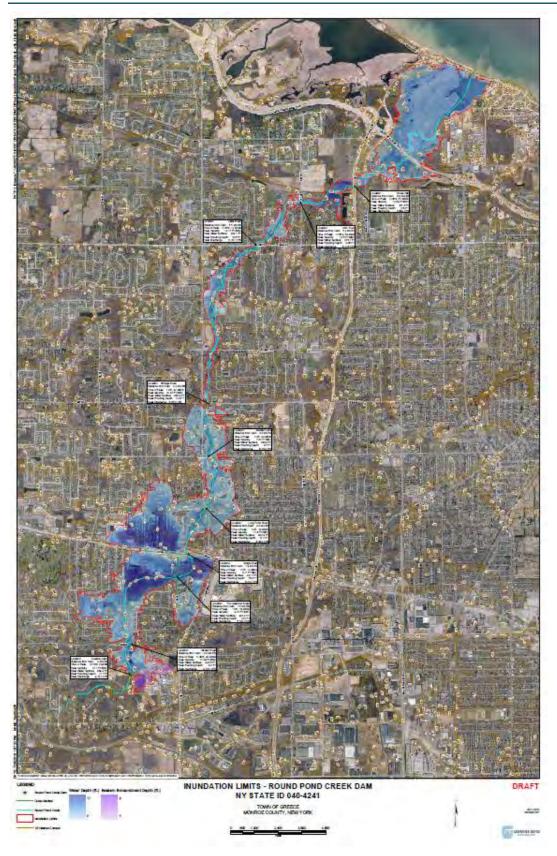
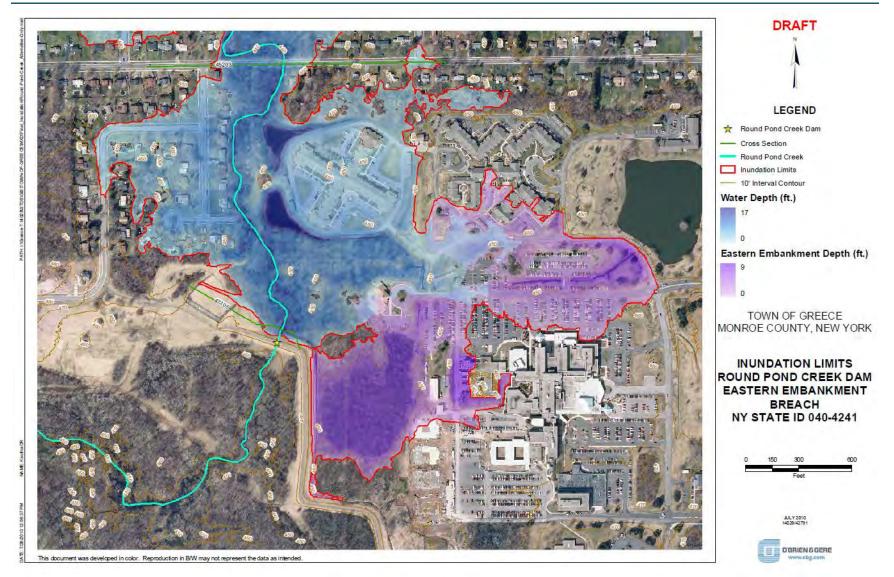






Figure K-3. Round Pond Creek Dam – Eastern Embankment Breach Inundation Map







Impact on Life, Health and Safety

The impact of dam and levee failure on life, health, and safety is dependent on several factors such as the class of dam/levee, the area that the dam/levee is protecting, the location of the dam/levee, and the proximity of structures, infrastructure, and critical facilities to the dam or levee structure. The level of impact that a failure would have can be predicted based upon the hazard potential classification as rated by the United States Army Corps of Engineers (State of NJ 2019). Table outlines the recommended hazard classifications.

Hazard Category(a)	Direct Loss of Life (b)	Lifeline Losses (c)	Property Losses (d)	Environmental Losses (e)
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.

b. Loss-of-life potential is based on inundation mapping of area downstream of the project. Analyses of loss-of-life potential should take into account the population at risk, time of flood wave travel, and warning time.

c. Lifeline losses include indirect threats to life caused by the interruption of lifeline services from project failure or operational disruption; for example, loss of critical medical facilities or access to them.

d. Property losses include damage to project facilities and downstream property and indirect impact from loss of project services, such as impact from loss of a dam and navigation pool, or impact from loss of water or power supply. e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: State of NJ 2019

The entire population residing within a dam failure inundation zone is considered exposed and vulnerable to an event. The potential for loss of life is affected by the capacity and number of evacuation routes available to populations living within these areas. Those most at risk include the economically disadvantaged and the population over the age of 65. According to 2020 Census data, there are 100,484 persons living below the poverty level and 127,588 persons over the age of 65 within Monroe County. These populations are more at risk during a dam failure event because economically disadvantaged populations are likely to evaluate their risk and make the decision to evacuate based upon the net economic impact to their family, while elderly populations are likely to seek or need medical attention. The availability of medical attention may be limited due to isolation during a flood event and other difficulties in evacuating. There is often limited warning time for a dam failure event. Populations without adequate warning of the event are highly vulnerable.

Impact on General Building Stock

Buildings located downstream of a dam are at risk to damages should there be a failure. Downstream inundation areas were not available to quantify any potential losses to structures. Properties located closest to the dam inundation area have the greatest potential to experience the largest, most destructive surge of water. The overall impact of flooding damages caused by dam failure will vary depending on the depth of flooding and velocity of the surge.

Dam failure can cause severe downstream flooding and may transport large volumes of sediment and debris, depending on the magnitude of the event. Widespread damage to buildings and infrastructure affected by an





event would result in large costs to repair these locations. In addition to physical damage costs, businesses can be closed while flood waters retreat, and utilities are returned to a functioning state.

Impact on Critical Facilities and Lifelines

Dam failures may also impact critical facilities and infrastructure located in the downstream inundation zone. Consequentially, dam failure can cut evacuation routes, limit emergency access, and/or create isolation issues. Dam failure can cause severe downstream flooding and may transport large volumes of sediment and debris, depending on the magnitude of the event. Further, utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

Impact on the Economy

Severe flooding that follows an event like a dam failure can cause extensive structural damage and withhold essential services. The cost to recover from flood damages after a surge will vary depending on the hazard risk of each dam.

Severe flooding that follows an event like a dam failure can cause extensive damage to public utilities and disruptions to delivery of services. Loss of power and communications may occur and drinking water and wastewater treatment facilities can become temporarily out of operation. Debris from surrounding buildings can accumulate should the dam mimic major flood events, such as the 1-percent annual chance flood event that is discussed in Section 5.4.5 (Flood).

Impact on the Environment

The environmental impacts of a dam failure can include significant water-quality and debris-disposal issues or severe erosion that can impact local ecosystems. Flood waters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate residential and commercial buildings and the flooded waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals may get added to flood waters. Hazardous materials may be released and distributed widely across the floodplain. Water supply and wastewater treatment facilities could be offline for weeks. After the flood waters subside, contaminated and flood-damaged building materials and contents must be properly disposed of. Contaminated sediment must be removed from buildings, yards, and properties.

