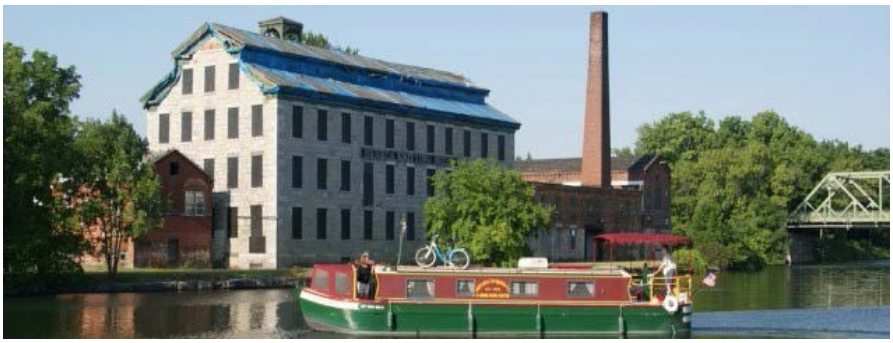
SENECA COUNTY



MULTI-JURISDICTION HAZARD MITIGATION PLAN

2018

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Section I Introduction

A. Purpose

The purpose of the Hazard Mitigation Plan is to give Seneca County and its municipalities an integrated strategy and direction for planning development and implementing hazard mitigation projects that will minimize disaster impacts and losses. The goals and objectives set forth in this plan, including the proposed projects and actions to be taken, have been cooperatively determined and agreed upon by all governing bodies within Seneca County. To achieve this goal, the Hazard Mitigation Plan is organized into three parts; 1) identification of natural and manmade hazards and vulnerabilities that may impact Seneca County and its municipalities, 2) the establishment of goals and objectives that will guide County and local government actions to minimize hazard impacts on citizens and property, and 3) a description of how the County and local jurisdictions will implement the actions called for in the plan.

B. Scope

This is a multi-jurisdiction, all-hazards mitigation plan that addresses the risks, vulnerabilities and strategies for mitigating all hazards in Seneca County and each of its ten (10) towns and five (5) villages, which have participated in development and approval of the plan.

The plan is intended to meet hazard mitigation planning requirements established by federal law in the *Disaster Mitigation Act of 2000*, (DMA 2000), Public Law 106-390.

It is understood that this is not an emergency response plan, but a plan to guide future projects and development with the goal of protecting lives and decreasing or eliminating damages to property and infrastructure caused by natural and manmade hazards that affect our communities.

C. Background

Natural hazards, which include flooding, severe storms and tornados have long been the most severe disasters that impact upstate communities across New York State. Flooding and severe storms can have similar effects throughout Seneca County, but there are also unique situations and conditions in each jurisdiction that require special planning and targeted solutions to prevent hazards and reduce threats. Every town and village in Seneca County must continually take steps to improve drainage and manage runoff, but there are areas in the south of the county that are more susceptible to flash flooding and one-hundred years of highway expansion, transportation growth and commercial development influence risks in the center of the County. In the Thruway – Route 318 corridor to the north, emerging development must incorporate risk management measures to limit potential hazards.

The Hazard Mitigation planning program for Seneca County partners with resources and laws established by the state and federal governments to implement an integrated approach to hazard prevention and disaster mitigation. The centerpiece of this program is the federal *Disaster Mitigation Act of 2000 (DMA 2000)*, which provides support and funding for hazard mitigation planning and improvements. In response to community needs and following the requirements of DMA 2000, Seneca County -- including all towns and villages – prepared a Multi-Jurisdiction All-Hazards Mitigation Plan (HMP) in 2008, which is replaced and updated by this 2018 plan.

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 process a jurisdiction uses and the document it prepares to evaluate potential natural hazards and implement strategies and actions to mitigate such hazards

DMA 2000 was enacted by Congress to improve disaster preparedness and prevention by providing incentives and resources to states and local governments to develop pre-disaster mitigation plans and implement hazard mitigation actions.

Congress has authorized funding and the Federal Emergency Management Agency (FEMA) has issued requirements for development of hazard mitigation plans, including revisions and updates. The New York State Division of Homeland Security and Emergency Services (DHSES) Administers the DMA 2000 program in New York and supports local government planning and project funding.

DMA 2000 requires that hazard mitigation plans be updated every five (5) years in order to effectively prepare for disasters and reduce potential hazards. DMA 2000 is intended to facilitate cooperation between state and local authorities by encouraging agencies to communicate and collaborate with each other in the planning process. This kind of integrated government planning better enables local and state governments to prioritize community mitigation needs and develop a unified hazard mitigation strategy that includes the entire county.

FEMA estimates that for every dollar spent on damage prevention **(**mitigation**)**, twice that amount is saved when post-disaster damages and impacts are avoided

D. Community Overview

Geography

Seneca County is situated upstate in the heart of the New York's Finger Lakes Region. The county is bounded by the Lake Ontario plain to the north, the central Southerntier region to the south, Cayuga and Seneca lakes form portions of its east and west borders and it is traversed from east to west by the Erie Canal and New York State Thruway. The County extends 35 miles from north to south and about eight to ten miles from east to west. Seneca County is bounded by Wayne County to the north, Cayuga and Tompkins counties to the east, Tompkins and Schuyler counties to the south and by Yates and Ontario counties to the west.

The identity of Seneca County is formed by a close relationship with its natural resources and stunning landscapes; including two of New York's Finger Lakes, wetlands, rolling hills, lakeside slopes, grasslands, woodlands and abundant farmland. Outdoor recreation, boating, hunting and fishing are enjoyed by residents and draw thousands of tourists to Seneca County. A favorable climate influenced by the slopes and lakes, as well as the right kind of soil for vineyards, make Seneca County a center for agriculture and wine production.

The area that would become Seneca County was originally the rich and bountiful homeland of Native Americans who farmed, hunted and fished in the region. Eastern pioneers began settling the area in the mid-1700s seeking opportunities offered by the vast tracts of fertile soil, forested and timbered land, plentiful wildlife and abundant water resources. The expansive plains and watersheds to the north and the temperate slopes of the Finger Lakes provided the agricultural and transportation opportunities that supported a westward expanding nation and would become the home of modest populations engaged in farming, service businesses, manufacturing and tourism.

Superior farmland and the development of transportation and water resources became the dominant features that shaped the growth and future of Seneca County. Rich, well-drained soils and a temperate climate made the region ideal for growing crops and the Seneca River with its 45-foot drop provided a site for powering mills that would process lumber, produce flour and manufacture textiles.

In 1818, New York State used the Seneca River to link the Finger Lakes to statewide development of the Erie Canal, making Seneca County an important part of the transportation corridor that would support America's immigrant expansion from the east to the nation's heartland and central plains. It was this early canal development that also established Seneca Falls and Waterloo as the commercial and population center of Seneca County, which was reinforced by the building of railroads in the 1840s.

The flat terrain of northern Seneca County, part of the Great Lakes plain of upstate New York, became host to the interstate highway system in the 1950s when the NYS Thruway was constructed through the towns of Tyre and Junius. In recent decades, this corridor has become a secondary center of commercial expansion and development.

Throughout its history, the natural resources of Seneca County and the Finger Lakes region have offered wide-ranging opportunities for outdoor recreation, vacationing and tourism. Traditional activities related to hunting, fishing, camping and a summer cottage industry have existed for generations, but today the geography also supports growing uses such as wineries, conservation, charter fishing, marine services, expanded public access to waterways and the development of high profile second homes.

North of the canal and State Routes 5&20, the geography of Seneca County is dominated by 'drumlins' or rolling hills and low-lying swamps where land elevations are between 390 feet above sea level in the Montezuma marshlands to 560 feet among the hills in the Junius Ponds area.

The area south of the Routes 5&20 corridor is considered part of the Appalachian Upland region and more specifically referred to as the Finger Lakes hills. Shoreline elevations along Cayuga and Seneca Lake range from of 381 feet and slope upwards to hilltops in the center of the county to 720 feet in the Town of Fayette, 940 feet in Romulus, 1,140 feet in Ovid and a peak of 1,630 feet in Lodi.

Seneca and Cayuga Lakes flow from south to north and are part of the Lake Ontario watershed. Seneca Lake flows into the Seneca River and then into Cayuga Lake. Cayuga Lake then flows to the Cayuga-Seneca Canal on to the Oswego River.

Regional Profile of Seneca County

Source: Seneca County Industrial Development Agency

Population and Housing

Seneca County – U.S. Census 2015 Population Estimates	
Population	34,833
Persons per square mile	108.9
Percent under age 5	5.3 %
Percent age 65 and older	17.6 %
Those under 65 with a disability	10.7
Housing units	16,210
Owner occupied housing	73.1 %
Median value – owner occupied housing	$ 95,400
Building permits - 2015	27
Households	13,485
Persons per household	2.38
Language other than English spoken at home	6.6 %
Median household income	$ 48,932
Per capita annual income	$ 23,823
Persons in poverty	14.2 %

Regional Population Changes 1990 to 2015

County	Estimate 2015	% change from 2010	% change from 1990
Seneca	35,351	- 1.2%	+4.9%
Cayuga	78,288	- 2.2%	- 4.9%
Ontario	109,561	+1.4%	+15.2%
Schuyler	18,186	- 0.8%	- 2.5%
Tompkins	104,926	+3.3%	+11.5%
Wayne	91,446	- 2.5%	+2.6%
Yates	25.048	- 1.2%	+9.8%

Municipal Population Changes 1990 to 2015

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Covert	2213	2,154	+2.7%	2246	-1.0%
Fayette	3928	3,929	<1.0%	3636	+8.0%
Interlaken	638	602	+6.0%	680	-6.3%
Junius	1408	1,471	-4.3%	1354	+4.0%
Lodi, T	1686	1,550	+8.8%	1429	+18.0%
Lodi, V	294	291	+1.0%	364	-19.2%
Ovid, T	2226	2,311	-3.7%	2306	-3.5%
Ovid, V	620	602	+3.0%	660	-6.0%
Romulus	4333	4,316	<1.0%	2532	+71.1%*
Seneca Falls **	8848	9,043	-2.2%	9384	-5.7%
Tyre	923	981	-6.0%	870	+6.1%
Varick	1914	1,857	+3.0%	2161	-11.4%
Waterloo, T	7595	7,642	<1.0%	7765	-2.2%
Waterloo, V	5178	5,171	<1.0%	5116	+1.2%

* The increase in Romulus is primarily attributed to institutional Corrections populations housed at New York State and Seneca County facilities,

** Seneca Falls consolidated population includes the town and former village

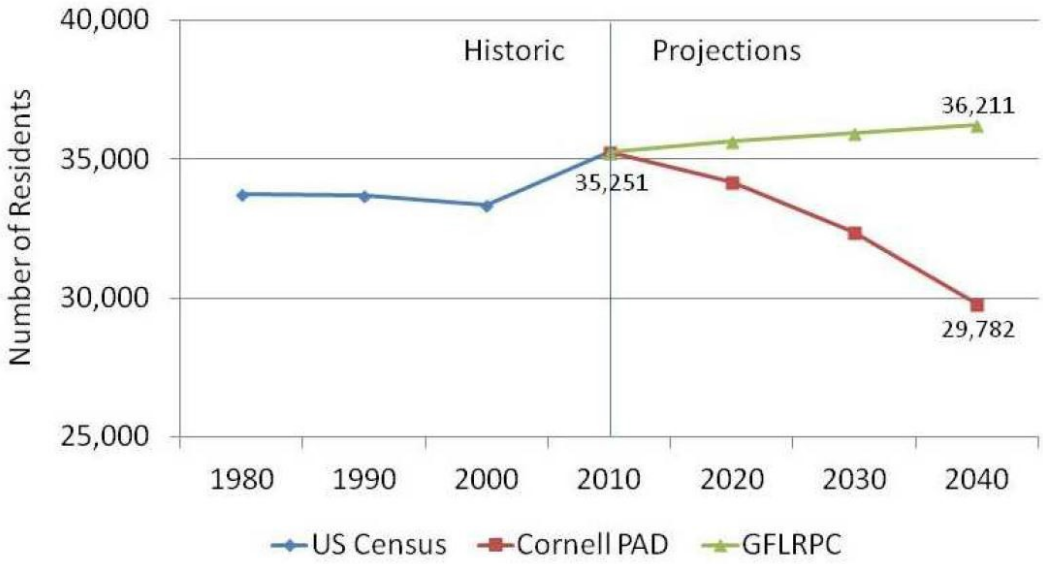
Source: U.S. Census Data, 2015, 2010 and 1990

Development and Population Impacts

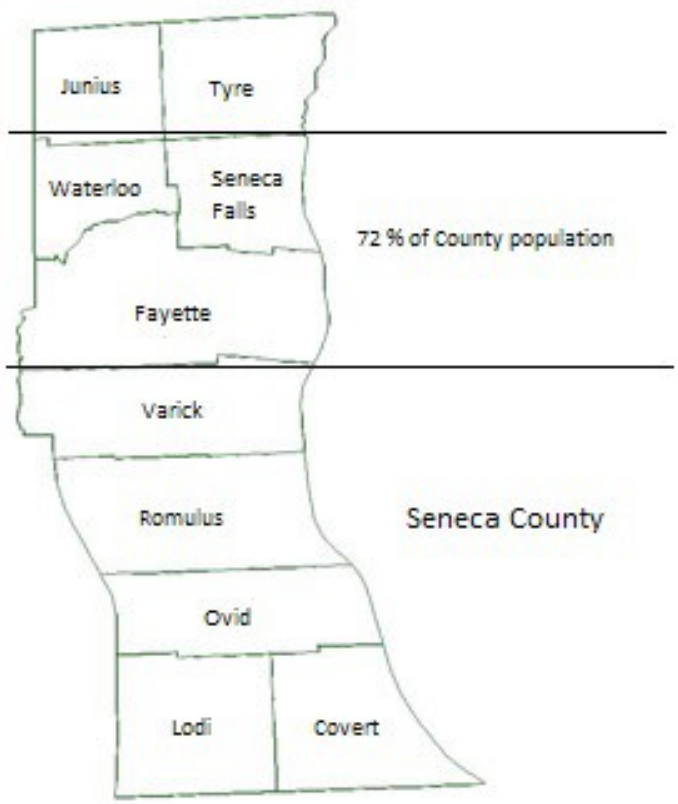
The population and commercial center of Seneca County is located in the towns of Seneca Falls and Waterloo. Together they contain more than half of the County's population and provide over half the jobs within the County. The Correctional facilities in the Towns of Romulus and near Ovid also provide numerous jobs, but much of the surrounding population is engaged in agriculture or residents are employed in the Seneca Falls-Waterloo area and adjacent counties. Commercial and casino development in the Route 318 & 414 corridor has expanded market and labor profiles in the Towns of Junius, Seneca Falls and Tyre, but significant residential expansion in these commercial areas is not anticipated. Planned development at the former Seneca Army Depot in the Towns of Romulus and Varick, small housing developments planned in the Towns of Fayette and Lodi and activity associated with tourism and recreation will result in only modest population growth. Empire Development Zones have been established in Tyre, Romulus, Varick, Waterloo and Seneca Falls, which provide incentives for strengthening business and employment, but they are not expected to trigger significant population growth.

Both the *Genesee/Finger Lakes Regional Planning Council* and the *Cornell University Program on Applied Demographics* have projected Seneca County's population to 2030. The Regional Planning Council estimates a small but steady increase in the number of residents. Cornell, on the other hand, forecasts a slow but steady decline. In both cases, the rate of projected change is low. The Regional Planning Council estimates the population will grow at a rate of 0.09% per year; Cornell estimates the County's population will decrease at a rate of 0.56% per year. Change at these rates, either positive or negative, is considered manageable.

Seneca County Population Projections



Source: Seneca County Comprehensive Plan, 2014



Source: U.S. Census Estimates, 2015

Where people reside in Seneca County today aligns with historical patterns of agriculture and commercial development. The average population density for Seneca County towns and villages is provided in the following table and map. The data are from the 2010 Census. Village calculations include the former Village of Seneca Falls, which was dissolved and merged with the Town of Seneca Falls in 2011.

Seneca County – Average Population Densities, 2010 Persons Per Square Mile	
County	108.5
Towns	71
Villages	2,241

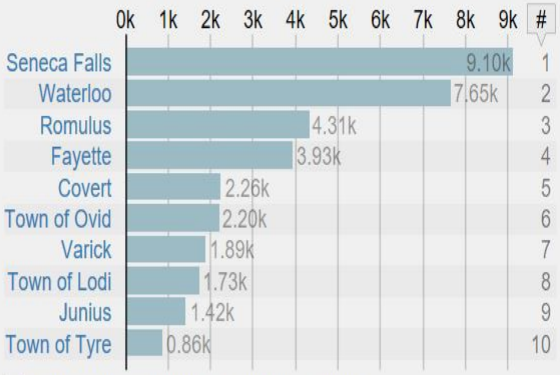
Source: US Census, 2010
Seneca County Comprehensive Plan, 2014

Population by County Subdivision in Seneca County

There are 11 county subdivisions in Seneca County. This section compares all 11 of those to each other.

Total Population by County Subdivision #9

Scope: population of selected county subdivisions in Seneca County

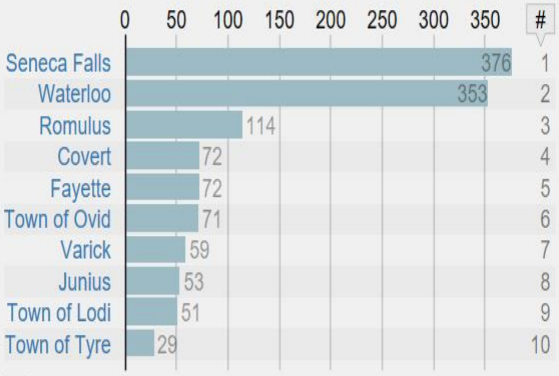


rank of county subdivision out of 10 by population

Population Density by County Subdivision #10

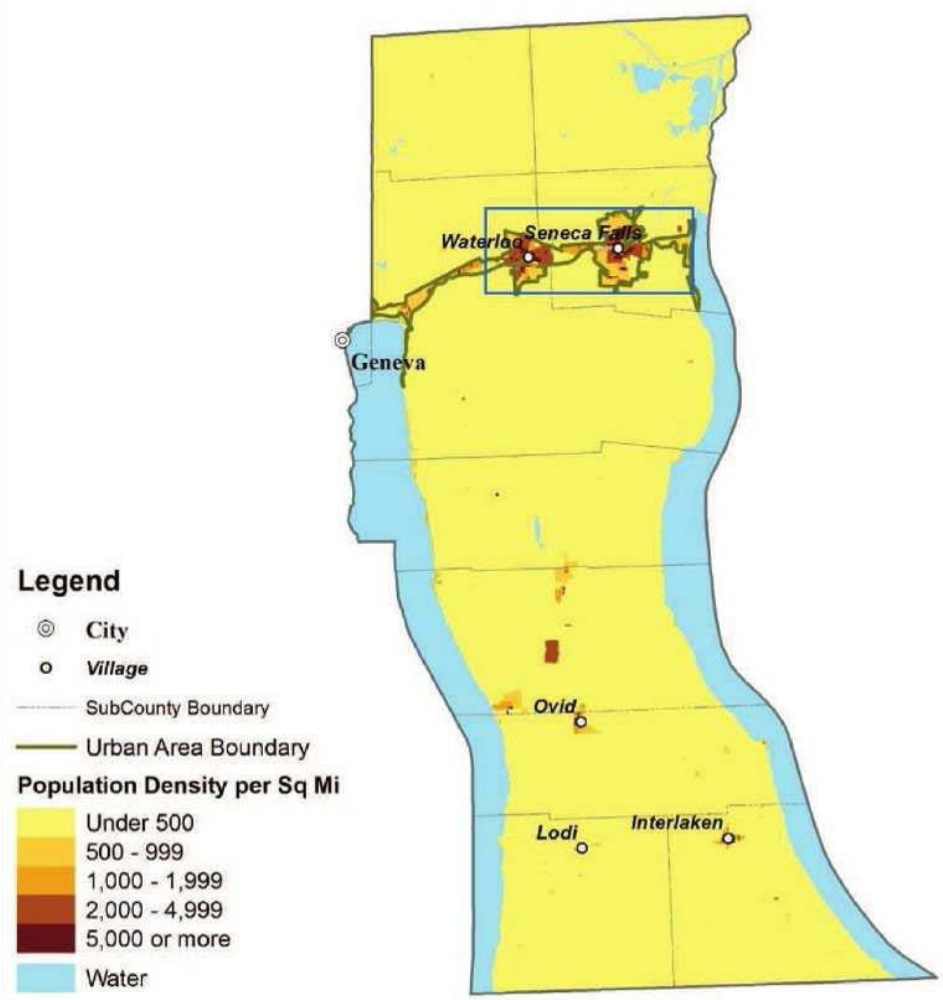
People per square mile (excluding waters).

Scope: population of selected county subdivisions in Seneca County



rank of county subdivision out of 10 by population density

Population Density Per Square Mile, 2010



Source: Cornell Program on Applied Demographics

Economy and Employment

Small businesses play a vital role in the Seneca County economy and the manufacturing and retail sectors employ one-third of all county workers. According to the U.S. Small Business Administration, there are more than 700 private businesses in Seneca County, but only one has more than 500 employees. Seneca County's diverse small businesses include health care, eating and drinking establishments, special trade contractors, boutiques, agricultural services, specialty manufacturing, veterinarians, business services, retailers, automotive dealers, repair shops and convenience stores.

Retail and small business services are a leading factor in local economic growth and these small businesses account for nearly all new employment. In 2012, manufacturing, retail trade, private health care, individual and family services accounted for 42% of total jobs in Seneca County. Much of the retail activity is linked to the tourism industry, which includes the Waterloo Premium Outlets, hotels, restaurants, wineries and specialty shops.

Industrial and manufacturing activities continue to be key economic and employment sectors in Seneca County, but have been decreasing as a percentage of total employment.

Principal Job Classifications in Seneca County	
Government/Public Service	27.2 %
Manufacturing	18.3 %
Retail Trade	11.1 %
Health Care and Social Services	7.9 %
Accommodations and Food Service	6.3 %
Educational Services	4.9.%
All others	< 3.0 % each

* Source: NYS Department of Labor, Census of Employment and Wages, 2016

Utilities and Energy

New York State Electric and Gas Corporation supplies electric to homes and businesses in Seneca County and natural gas in higher density areas. While all users in Seneca County remain dependent on the utility grid for overall energy needs, several major energy consumers are supplementing their energy use with alternate or renewable sources. For example, the Seneca Meadows Landfill has created a renewable energy industrial park to capture methane gas emissions and convert them to low cost energy and farmers have installed biodigesters to convert animal waste to energy. The County Law Enforcement Center, schools and other commercial users have installed solar energy projects and geothermal heating and cooling are becoming more common.

Villages and higher density rural areas are served by public sanitary sewer systems. Existing wastewater treatment plants generally have excess capacity that can handle modest growth, but new economic development in the Route 318/414 corridor will require municipal sewer expansion, pump stations and treatment plant upgrades. The County is seeking to improve infrastructure services, including electric and sanitation, at the Seneca Army Depot to meet goals for expanding economic opportunities at the site

There are thirteen municipal water supply systems in Seneca County and all draw their supplies from Seneca and Cayuga Lakes. Areas within and immediately surrounding the villages and Seneca Army Depot generally have sufficient potable water service and users in rural areas have excellent access to private ground well supplies. Development in the Route 318/414 corridor and at the Seneca Depot will require improved water service.

Improvements and upgrades to aging water supply and wastewater systems in Seneca County are a high priority for local leaders. Maintaining service demands, avoiding infrastructure breakdowns and disruptions and assuring adequate water supply and pressure for firefighting require continuous modernization. The County also maintains programs to monitor and assist residents using private wells and septic systems and the use of “grey” water for agricultural irrigation is emphasized to manage runoff and contamination.

Technology

Fiber optics, broadband and high-speed internet access are available from commercial providers for residences and businesses throughout the County. Wireless service is widely available in populated areas and along major transportation routes, but there are spots or pockets in that do not have wireless capability. National and countywide trends suggest there is an ever greater need for digital access to support home businesses, emergency services and health care and Seneca County is continuing to work with New York State and neighboring jurisdictions to fully implement digital services.

Public Safety and Medical

The Seneca County Sheriff’s Department, New York State Police and three village police agencies in Waterloo, Seneca Falls and Interlaken provide security services in the County. There 14 community-based volunteer fire departments providing fire protection and rescue services in the County and three volunteer ambulance companies. There are no acute care medical facilities in the County and some residents are a 40 minute drive from the nearest hospital.

Transportation

Seneca County has approximately 525 miles of local roads that are maintained by the county, towns and villages. In addition, New York State maintains about 160 miles of highways in Seneca County; including the main north-south Routes 96, 96A, 414 and 89, and east-west routes 5&20, 318 and the NYS Thruway (Interstate 90). Development priorities are centered on the Routes 318 and 414 corridors near the NYS Thruway, expanding business opportunities along Routes 5&20 and improving transportation access to support commercial development of the former Seneca Army Depot. Management of truck traffic associated with the Seneca Meadows Landfill remains a high profile transportation issue for the State and County

The Finger Lakes Railway parallels Routes 5&20 from Geneva to Syracuse and is connected to the Norfolk Southern and Canadian Pacific Railways. It was recently improved to provide service to the Seneca Army Depot to facilitate a potential intermodal transportation hub at the Depot and construction of a rail spur to the Seneca Meadows Landfill has also been proposed to reduce truck traffic.

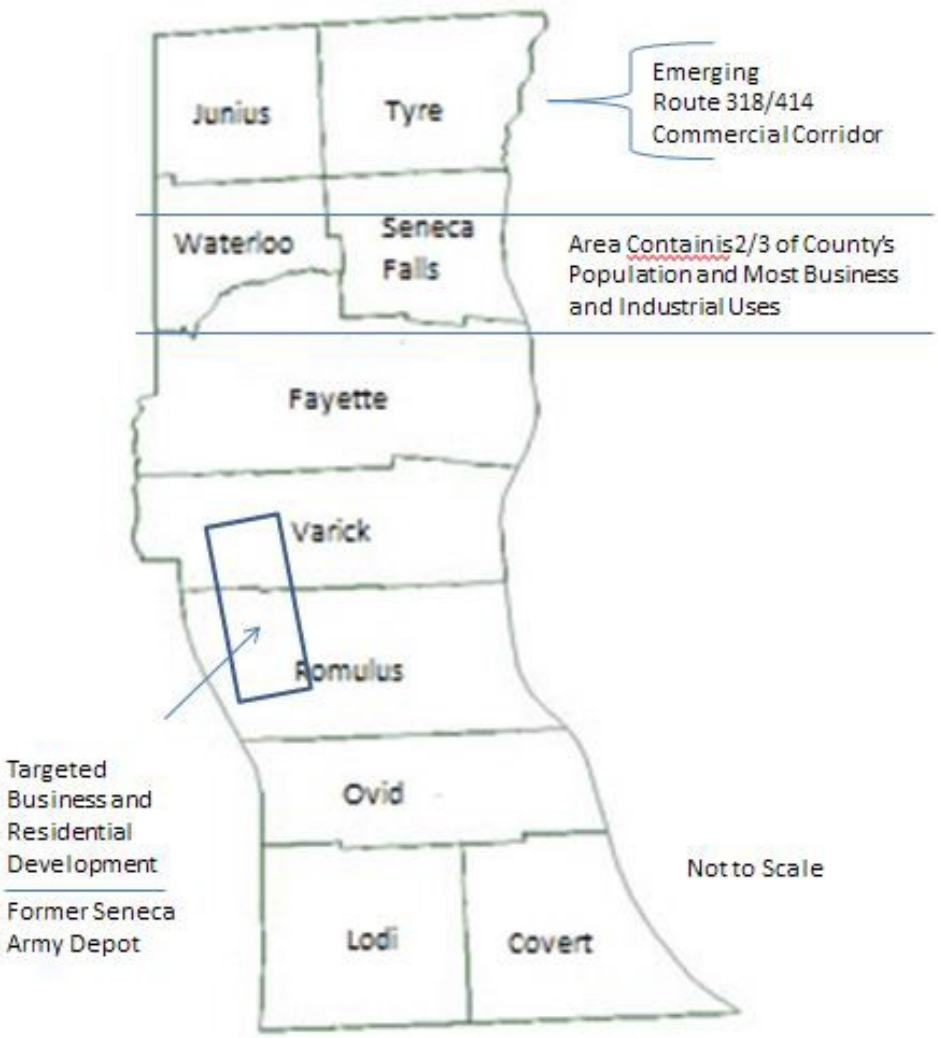
The Finger Lakes Regional Airport is a general aviation facility that serves as a base for business travel, tourism and agricultural services. The County owned airport is considered a key asset to maintain and promote economic growth in the region.

The Seneca Transit Service provides limited fixed-route, dial-a-ride, and para-transit services in the county. Seneca County and nonprofit organizations also provide transport assistance for the elderly, disabled and low-income residents for employment medical and essential personal needs.

The New York State Barge Canal continues to be a commercial transportation alternative supporting the economic profile of Seneca County, and it is still used to produce power, but the Canal is predominantly a significantly valuable recreation, tourism, cultural and historic resource for Seneca County.

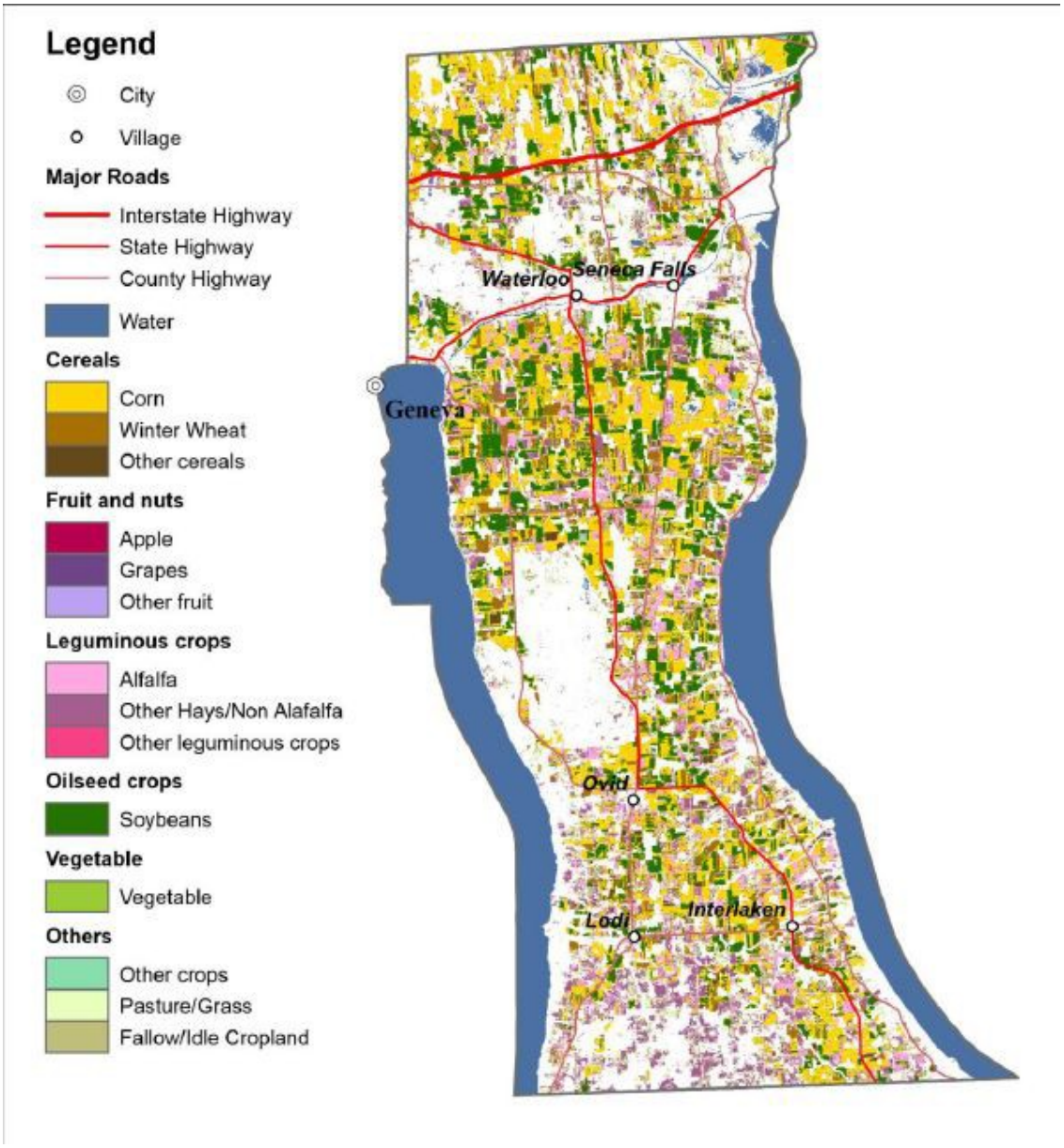
Land Use

The dominant land features of Seneca County are its rural and small town settings, sprawling farmlands, open space, rolling hills and sloping vistas of the Finger Lakes. The population and commercial center of Seneca County is located in the Towns of Seneca Falls and Waterloo; an area that contains about two-thirds of the County's population and provides over half the jobs within the County. In the northern towns of Junius and Tyre, the Route 318/41 corridor adjacent to the NYS Thruway is experiencing emerging retail and casino development. The former Seneca Army Depot, which now belongs to Seneca County and covers 10,587 acres in the Towns of Romulus and Varick, has been targeted as a future business expansion and development area



In 2008, farmland and agriculture covered 127,972 acres in Seneca County, which is 62% of the county's total acreage. About 18% of Seneca County is forested, which includes 1,600 acres of swamp woods in the Montezuma Wildlife Refuge (Town of Tyre) and about one-third (5,200 acres) of the Finger Lakes National Forest are in Seneca County.

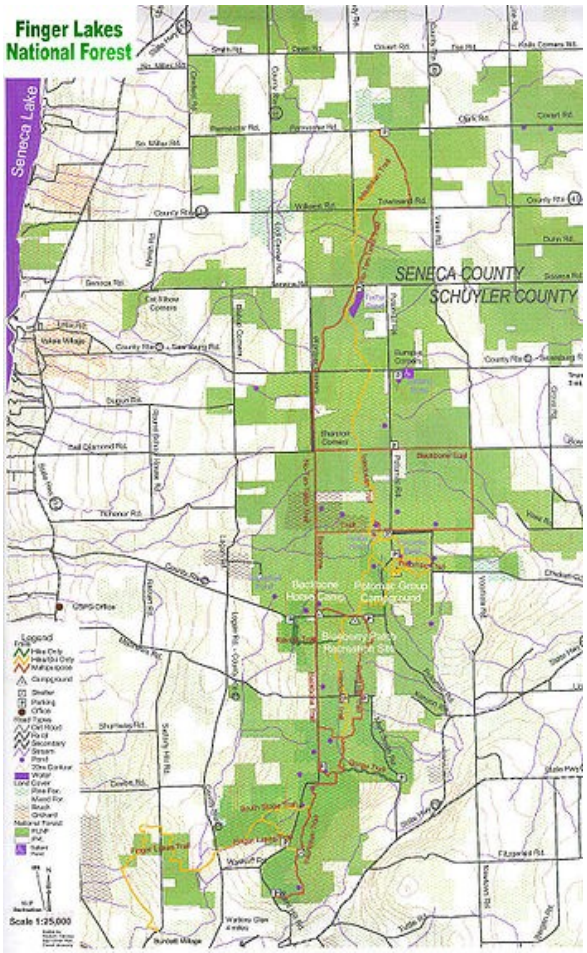
Agricultural Cropland in Seneca County



Finger Lakes National Forest

Seneca County
Town of Lodi

Schuyler County



The Montezuma National Wildlife Refuge is managed by the federal government and New York State owns and operates several wildlife management areas in Seneca County at Cayuga Lake/Canoga Marsh, Willard and Montezuma.

There are 72 miles of lakeshore in Seneca County on Cayuga and Seneca Lakes, predominantly occupied by permanent, single family homes and seasonal cottages, but the trend is to replace seasonal cottages with larger permanent residences. Other dominant lakeshore uses are the state parks and waterfront recreation. New York State operates seven parks and recreational facilities in Seneca County covering more than 2,000 acres.

- Bonavista State Park Golf Course
- Cayuga Lake State Park
- Dean's Cove State Boat Launch
- Lodi Point State Park
- Long Point State Park
- Seneca Lake State Park
- Sampson State Park

The Seneca Meadows Landfill operators the 600-acre Seneca Meadows Landfill on Route 414 in Seneca Falls

Google Maps – highlighting not to scale

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Section II Planning Process

A. Project Leadership

The Seneca County Multi-Jurisdiction Hazard Mitigation Plan is developed and maintained under the authority and direction of the Seneca County Board of Supervisors. The Director of the Seneca County Emergency Management Office provides overall leadership, organization and support needed to prepare and update the Hazard Mitigation Plan. Each municipal jurisdiction in Seneca County and supporting agencies is responsible for providing a representative that will coordinate local or agency participation in the Hazard Mitigation planning process with the Steering Committee and Emergency Management Director. Funding, guidance and resources for plan development in 2008 and the 2018 update are provided by the Federal Emergency Management Agency (FEMA) and the New York State Division of Homeland Security and Emergency Services (NYSDHSES).

B. Hazard Mitigation Steering Committee

Seneca County has established a *Hazard Mitigation Steering Committee* (HMSC) to provide the specialty support and broad community representation necessary to effectively develop and implement a community-wide plan to address Hazard Mitigation for all local jurisdictions. The Steering Committee is the core leadership group that meets regularly to review and monitor planning goals and strategies and provide overall guidance on development and implementation of the plan. The HMSC brings together the participants and resources necessary to insure that the goals, objectives and projects outlined in the Plan are effectively implemented.

The Hazard Mitigation Steering Committee includes County leaders, representatives of participating local governments and key agencies responsible for supporting the Hazard Mitigation planning process. Assistance to the Steering Committee is provided by State and regional agency representatives and the Federal Emergency Management Agency (FEMA). The HMSC is chaired by the Seneca County Emergency Management Director and also receives support from the *Seneca County Local Emergency Planning Committee (LEPC)*, which serves as an emergency management, disaster response and hazardous materials preparedness coordinating body for the County. The following local officials and agency representatives are members of the *Hazard Mitigation Steering Committee*.

Name	Title	Agency
Melissa Taylor	Director	Seneca County Emergency Management
Brandi Godley	Deputy Director	Seneca County Emergency Management
Toni DiGiovanni	Planner/Trainer	Seneca County emergency Management
Jeffrey Case	Fire Coordinator	Seneca County Emergency Management
Roy Gates	Superintendent	Seneca County Highway Department
W. Timothy Luce	Sheriff	Seneca County Sheriff
Peter Brown	Deputy Director	Seneca County Code Enforcement
Harriet Haynes	Senior Planner	Seneca County Planning and Development
Jim Malyj	District Manager	Soil and Water Conservation District
E. Lee Davidson	Supervisor	Town of Lodi
Ruth Same	Citizen and Resident	Town of Seneca Falls
Roxanne Kelly	Citizen and Resident	Town of Fayette

The Hazard Mitigation Steering Committee is responsible for the following tasks:

- Establish plan development goals
- Establish a timeline and monitor scheduling for plan completion
- Solicit and encourage the participation of the towns, villages, other agencies and citizens
- Assist in gathering information to be included in the plan
- Develop, revise, and maintain the plan

C. Steering Committee Activities

Aside from discussion and review at meetings noted below, members of the Steering Committee maintain ongoing relationships and are in regular contact with municipal and agency officials where issues and priorities related to hazard mitigation are considered. Steering Committee members regularly attend County Board of Supervisor meetings, Town and Village Board meetings and association meetings of Highway Superintendents, local Planning Boards and public safety functions. They are also area leaders who commonly attend meetings with state and federal authorities and participate in professional forums associated with their specialties, such as drainage and flood prevention, codes and standards. It is in these types of settings where suggestions and proposals for hazard mitigations projects emerge and are evaluated, and later they are brought before the Committee and considered for inclusion in the Hazard Mitigation plan.

Steering Committee members, like the Highway Superintendent and Soil and Water District Manager, play an important role in helping Town and Village authorities formulate their proposals for natural hazard mitigation. Local officials are frequently the ones who first identify problems and areas where improvements are needed, but specialists and program managers who

serve on the Steering Committee often help match their needs with potential solutions and move an idea to a proposal that can be documented and framed in the hazard mitigation plan.

The Steering Committee is also a key resource that assists the Hazard Mitigation planning consultants with their work to collect information, prepare and review the plan. As subject matter experts with personal knowledge of local programs and their relationships with local leaders, Committee members provide the consultants with information and guidance essential to building a plan that targets local needs and capabilities. By their involvement in planning measures to highlight and profile local hazards, assess risks and vulnerabilities and developed appropriate mitigation strategies, the input of Steering Committee members is essential to development of a plan that will be embraced by all stakeholders in the community.

The Steering Committee met on the dates noted below, which were scheduled as-needed based upon the progress of the planning work and the need for Committee input and review. Not all committee members were able to attend all meetings, but in many cases the planning consultants would also reach out to Committee members and personally meet with them to discuss specific topics and how they could help.

The following table summarizes HMSC meetings, topics and attendance. Meeting notices, agendas and topics are included in Appendix 2.

Hazard Mitigation Steering Committee Meetings			
Date		**Purpose**	**Attendees**
2017	March 8	Review the final draft plan; specifically the Hazard Assessment and Vulnerability sections, NFIP analysis, local goals and projects and future development considerations	Melissa Taylor, Emergency Services Director Toni DiGiovanni, Emergency Services Planner Brandi Godley, Emergency Services, 9-1-1 Roy Gates, County Highway Superintendent E. Lee Davidson, Town of Lodi/Board of Supervisors W. Timothy Luce, County Sheriff Jim Malyj, Soil and Water Conservation District Roger Lander, Planning Contractor Bill Clark, Planning Contractor
2016	June 27	Review planning draft preparation related to the risk assessment, county and local government projects and goals	Melissa Taylor, Emergency Services Director Roy Gates, County Highway Superintendent Peter Brown, Code Enforcement Brandi Godley, E-911 director Bill Clark, Planning Contractor
2015	September 21	Review planning work and mitigation project development that is underway with participating agencies, towns and villages	Melissa Taylor, Emergency Services Roy Gates, Highway Superintendent Jim Malyj, Soil and Water Conservation District Peter Brown, Code Enforcement E-911 Center Representative Bill Clark, Planning Contractor
2015	June 11	Conduct a joint meeting with the Seneca County Local Emergency Planning Committee (LEPC) to discuss planning priorities, emphasis and development	Charles McCann, Emergency Services Melissa Taylor, Emergency Services Roy Gates, Highway Superintendent Jim Malyj, Soil and Water Conservation District Peter Brown, Code Enforcement E-911 Manager Bill Clark, Planning Contractor
2015	June 10	Conduct the NYS Hazard Analysis (HAZNY). Review risk and vulnerability assessment priorities and data	Charles McCann, Emergency Services Director Melissa Taylor, Emergency Services Roy Gates, Highway Superintendent Jim Malyj, Soil and Water Conservation District Peter Brown, Code Enforcement Sheriff's Department Supervisor E-911 Center Manager Public Health Representative Bill Clark, Planning Contractor Roger Lander, Planning Contractor

Hazard Mitigation Steering Committee Meetings			
Date		**Purpose**	**Attendees**
2015	May 11	Kick-Off meeting to discuss planning goals, schedule, resources, agency and citizen participation and information gathering	Charles McCann, Emergency Services Melissa Taylor, Emergency Services Roy Gates, Highway Superintendent Jim Malyj, Soil and Water Conservation District Peter Brown, Code Enforcement Health Department Representative E-911 Center Representative Paul Weberg, FEMA Joyce Nolan, Citizen and Waterloo Resident Bill Clark, Planning Contractor Roger Lander, Planning Contractor
2015	April 21	Organizational and project planning meeting with principal County officials	Charles McCann, Emergency Services Melissa Taylor, Emergency Services Roy Gates, Highway Superintendent Jim Malyj, Soil and Water Conservation District Peter Brown, Code Enforcement Seneca Falls Supervisor Bill Clark, Planning Contractor Roger Lander, Planning Contractor

D. Description of Planning Events and Participant Activities

Planning meetings, briefings and workshops were used to review planning goals, evaluate mitigation issues and to seek input from participating jurisdictions in development of the Hazard Mitigation Plan. Emails and planning reports were also exchanged with participating agencies and local jurisdictions.

Kick-Off Meetings

A series of Kick-Off and project planning meetings were held with participating jurisdictions between January and September of 2015. The purpose of the local Kick-Off meetings were to outline the goals and scope of the hazard mitigation plan update process and identify what information and input would be required from plan participants. An important outcome of the Kick-Off meetings was to meet with community leaders to review elements of the original 2008 plan and formulate a revised set of hazard mitigation strategies and projects for the revised plan.

A general Kick-Off meeting was held on May 11, 2015 that included representatives of the Hazard Mitigation Steering Committee, key emergency service and public works agencies and local government leaders. This was followed up by two regional Kick-Off meetings in the north and south of the County for town and village representatives -- and where local officials were unable to attend these meetings or required more detailed follow-up, planning staff scheduled visits to their municipal offices. A notice about these meetings and worksheets used to capture information about proposed hazard mitigation proposals and projects are included in Appendix 2.

Risk Assessment Meeting

A joint meeting was held on June 10, 2015 with the Hazard Mitigation Planning Committee (HMPC) and the Local Emergency Planning Committee (LEPC) that used New York State's interactive hazard evaluation program, *Hazard Analysis – New York (HAZNY)* to begin revision of the Risk Assessment for the updated Hazard Mitigation Plan. The HAZNY, which is summarized in the Section III of this Plan, is used to examine the kinds of hazards that could potentially affect Seneca County and serves as a building block for the comprehensive risk assessment included in Section III of this Plan. This meeting also addressed preparation of the state and federal *Threat and Hazard Identification and Risk Assessment (THIRA*), a worksheet prepared by the U.S. Department of Homeland Security to evaluate state and local natural and manmade hazards. The results of the THIRA are also integrated with the HAZNY and Risk Assessment in Section III.

Local/On-Site Planning Activities

As the Hazard Mitigation planning process continued, it was necessary to conduct various on-site meetings with local officials in the participating jurisdictions; and on occasion planning materials and documents were obtained using email and telephone. The purpose and outcomes of these local/on-site activities included the following.

- Review the status of strategies and projects identified in the 2008 plan
- Re-examine potential hazards, risks and vulnerabilities
- Consider new mitigation project proposals and revisions to local strategies
- Visit new and previously identified project sites
- Prepare or revise descriptions for previous and new projects
- Evaluate and prioritize mitigation projects
- Assemble project data, maps, support materials and project cost estimates
- Work with local officials to promote citizen input and participation in plan development
- Discuss the process and opportunities for using FEMA Hazard Mitigation project grants

Agency Meetings

Meetings were held with the following local and regional agencies to review and update risk assessment factors, consider projects having regional or county-wide implications and to integrate supporting mitigation resources into the updated plans.

Agency	Topics and Issues
Seneca County Highway Department	Review County Highway projects and priorities Review local projects and strategies Consider natural hazards, drainage and steep slopes Examine integrated county, local and state interests Review Border City/HEP/Waterloo mitigation issues Assisting with FEMA Hazard Mitigation Project Grants
Seneca County Planning & Development	Review of complimentary local plans Demographic Data and Analysis Update land use analysis and outlook Monitor local planning, zoning and regulatory standards Floodplain Management activities and status Agricultural and farm community trends Assisting with FEMA Hazard Mitigation Project Grants
Seneca County Health Department	Discuss public health threats and risks Consider health related mitigation activities
Seneca County Economic Development	Review economic and industrial development goals Consider growth and development implications
Seneca County Code Enforcement	Review local code enforcement compliance Highlight hazard mitigation code activities Consider code and standard revisions
Seneca County Soil and Water Conservation District (SWCD)	Review County Highway projects and priorities Review local projects and strategies Consider natural hazards, drainage and steep slopes Examine integrated county, local and state interests Assisting with FEMA Hazard Mitigation Project Grants
NYS Department of Transportation	State Highway Hazard Mitigation activities Consider natural hazards, drainage and steep slopes Examine integrated county, local and state interests Review Border City/HEP/Waterloo mitigation issues
NYS Division of homeland Security and Emergency Services	Mitigation plan update support and administration Review of hazards, threats and vulnerabilities Hazard Analysis (HAZNY) Assisting with FEMA Hazard Mitigation Project Grants Homeland Security support and guidance

Agency	Topics and Issues
National Weather Service - Binghamton	Review of natural hazards risks and threats Weather data, history, updates and analysis Severe weather communications and warning

E. Participating Municipal Jurisdictions

Each of the fourteen (14) towns and villages located within Seneca County were included in the original 2008 Multi-Jurisdiction Hazard Mitigation Plan and were again participants in the 2017 plan update. Participating elected officials from Seneca County's towns and villages were also supplemented by key staff in their respective jurisdictions; including the Highway/Public Works Superintendent, Planning Board members and Fire Chiefs. Municipal code enforcement and building inspection services are administered by Seneca County, who participated in the planning process, Steering Committee functions and the review of local strategies and goals.

Principal Municipal Representatives for the Hazard Mitigation Planning Process

Town Supervisors in Seneca County are also members of the County Board of Supervisors, which is the governing body of Seneca County.

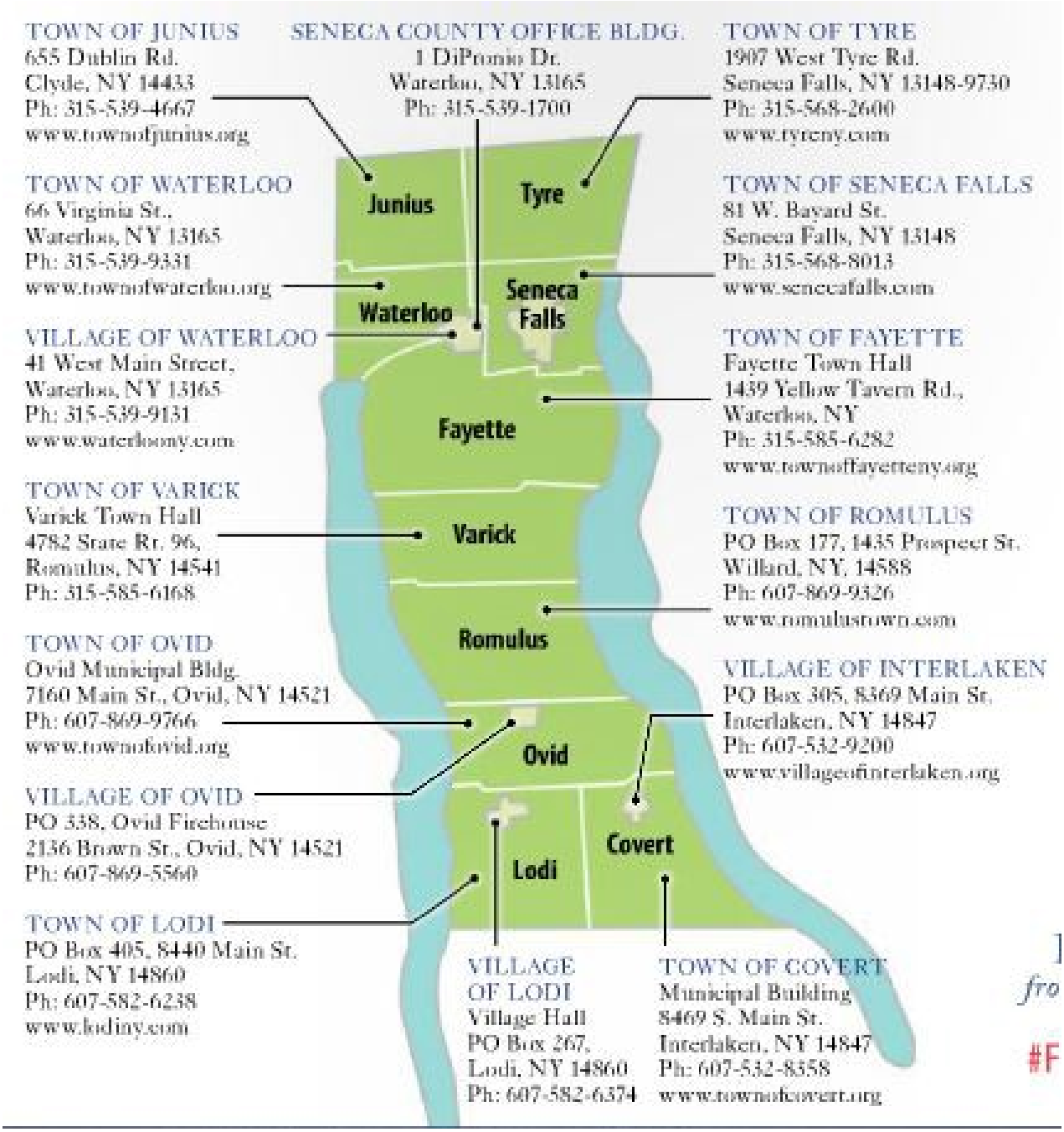
Town of Covert	Michael Reynolds, Supervisor
Town of Fayette	Cindy Garlick Lorenzetti, Supervisor
Village of Interlaken	Mayor (vacant until May, 2017)
Town of Junius	Greg Wadhams, Supervisor
Town of Lodi	E. Lee Davidson, Supervisor
Village of Lodi	Francis Stevenson, Mayor
Town of Ovid	Walt Prouty, Supervisor
Village of Ovid	David Terry, Mayor
Town of Romulus	David M. Kaiser, Supervisor
Town of Seneca Falls (Includes the former Village of Seneca Falls)	Gregory P. Lazzaro
Town of Tyre	Ronald F. McGreevy, Supervisor
Town of Varick	Robert W. Hayssen, Supervisor
Town of Waterloo	Gary Westfall, Supervisor
Village of Waterloo	Ted Young, Mayor

In addition to Town Supervisors, the Seneca County Board of Supervisors has four (4) At-Large members that represent the Town of Seneca Falls and the Town and Village of Waterloo.

Stephen J. Churchill	Seneca Falls
Paul Kronenwetter	Seneca Falls
Robert Shipley	Waterloo
Don Trout	Waterloo

Participating Municipal Highway and Public Works Officials

Jeffrey MacCheyne	Superintendent	Town of Covert
William Trout	Superintendent	Town of Fayette
Wes Ahouse	Superintendent	Village of Interlaken
David Fisk, Jr.	Superintendent	Town of Junius
Rick Jacot	Superintendent	Town of Lodi
John Wickham	Superintendent	Town of Ovid
Daryl Morrell	Superintendent	Town of Romulus
Donald Wood	Superintendent	Town of Seneca Falls
Nate Shumway	Superintendent	Town of Tyre
Richard McCulloch	Superintendent	Town of Varick
Joe Mull	Superintendent	Town of Waterloo
Stephen Ward	Superintendent	Village of Waterloo


TOWN OF JUNIUS
655 Dublin Rd.
Clyde, NY 14433
Ph: 315-539-4667
www.townofjunius.org
SENECA COUNTY OFFICE BLDG.
1 DiPronio Dr.
Waterloo, NY 13165
Ph: 315-539-1700
TOWN OF TYRE
1907 West Tyre Rd.
Seneca Falls, NY 13148-9730
Ph: 315-568-2600
www.tyreny.com
TOWN OF WATERLOO
66 Virginia St.,
Waterloo, NY 13165
Ph: 315-539-9331
www.townofwaterloo.org
TOWN OF SENECA FALLS
81 W. Bayard St.
Seneca Falls, NY 13148
Ph: 315-568-8013
www.senecafalls.com
VILLAGE OF WATERLOO
41 West Main Street,
Waterloo, NY 13165
Ph: 315-539-9131
www.waterloony.com
TOWN OF FAYETTE
Fayette Town Hall
1439 Yellow Tavern Rd.,
Waterloo, NY
Ph: 315-585-6282
www.townoffayetteny.org
TOWN OF VARICK
Varick Town Hall
4782 State Rt. 96,
Romulus, NY 14541
Ph: 315-585-6168
TOWN OF ROMULUS
PO Box 177, 1435 Prospect St.
Willard, NY, 14588
Ph: 607-869-9326
www.romulustown.com
TOWN OF OVID
Ovid Municipal Bldg.
7160 Main St., Ovid, NY 14521
Ph: 607-869-9766
www.townofovid.org
VILLAGE OF INTERLAKEN
PO Box 305, 8369 Main St.
Interlaken, NY 14847
Ph: 607-532-9200
www.villageofinterlaken.org
VILLAGE OF OVID
PO 338, Ovid Firehouse
2136 Brown St., Ovid, NY 14521
Ph: 607-869-5560
TOWN OF LODI
PO Box 405, 8440 Main St.
Lodi, NY 14860
Ph: 607-582-6238
www.lodiny.com
VILLAGE OF LODI
Village Hall
PO Box 267,
Lodi, NY 14860
Ph: 607-582-6374
TOWN OF COVERT
Municipal Building
8469 S. Main St.
Interlaken, NY 14847
Ph: 607-532-8358
www.townofcovert.org
Junius
Tyre
Waterloo
Seneca Falls
Fayette
Varick
Romulus
Ovid
Lodi
Covert

F. Type of Participation in the Planning Process

Participant	Type of Participation
Board of Supervisors	Project Authority, Oversight and Adoption Plan Review and Input Identify and Develop Mitigation Goals and Strategies Provide Information to the Public and Seek Citizen Input
Hazard Mitigation Steering Committee (HMSC)	Project Supervision, Priorities and Scheduling Plan Review and Input Coordination with Jurisdictions and Agencies Research, Data Collection and Fact-Finding Document Preparation and Organization Meeting Coordination and Presentations Risk Assessment and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies Provide Information to the Public and Seek Citizen Input
Emergency Management Director	Project Supervision and Scheduling Chair the Hazard Mitigation Steering Committee Coordination and Supervision of the Planning Consultant Coordination with Jurisdictions and Agencies Grant Administration and Coordination with the State Plan Review and Input Meeting Coordination and Presentations Risk Assessment and Evaluation of Hazards
Participating Jurisdiction Representatives	Plan Review and Input Identification and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies Provide Information to the Public and Seek Citizen Input
Project Consultant	Project Guidance and Advice Research, Data Collection and Fact-Finding Document Preparation and Organization Preparation of Maps and Graphics Meeting Coordination and Presentations Identification and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies
NYSDHSES / FEMA	Planning Support, Guidance, Review, Input and Approval
County Highway Department	Plan Review and Input Coordination with other Programs and Plans Research, Data Collection and Fact-Finding Maps, Graphics and Supporting Materials Floodplain Management Coordination Coordination with Local Jurisdictions Identification and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies
County Planning and Development	
Soil and Water Conservation District	
National Weather Service	

G. Project Timeline

Revised Project Schedule		
Activity	**Start Date**	**Revised Completion Date**
Review & Update Hazard-Mitigation Plan	January 2015	October, 2016
Project kickoff meetings	January, 2015	May, 2015
Risk Assessment interactive workshop, including update of the New York Hazard Analysis (HAZNY)	June, 2015	June, 2015
Review current inventory of available planning documents related to this project	February, 2015	Sept, 2016
Review and Revise Mitigation Actions	October, 2015	June, 2016
Prioritize Mitigation Actions	January, 2016	July, 2016
Prepare Implementation Strategy	January, 2016	July, 2016
Provide draft Mitigation Plan for and local review	July, 2016	October, 2016
Incorporate local revisions and modifications	May, 2016	September, 2016
Steering Committee Review of Final Draft	March, 2017	March, 2017
Submit plan to State/FEMA for review and comment.	March, 2017	March, 2017
Make revisions and modifications to Incorporate state and FEMA review	April, 2017	February, 2018
FEMA provides plan approval pending adoptions by County, Town and Village Boards	May, 2017	April, 2018
Complete final approved plan	May, 2017	May, 2018
Local plan adoptions by County, Town and Village Boards	April - June, 2017	April - August, 2018
Final FEMA approval	July, 2017	September, 2018

H. Review of Existing Plans

Seneca County Comprehensive Emergency Management Plan (CEMP) 2008

The CEMP is the County's all-hazards disaster preparedness and response plan that addresses all phases of emergency management for the County, including preparedness, response and recovery. The *Multi-Jurisdiction Hazard Mitigation Plan* is a part of the comprehensive plan that more specifically addresses preparedness and recovery activities related to preventing and/or reducing the occurrence and/or impacts of disasters. The CEMP forms the foundation or organizational system for development of the Hazard Mitigation Plan by setting policies and objectives for inter-governmental and inter-agency coordination of emergency management activities in the county. The integration of resources, leadership and mutual-aid set forth in the CEMP establish the framework for implementing cooperative strategies essential in a multi-jurisdiction hazard mitigation process.

Seneca County Comprehensive Plan, 2014

The County's master plan that addresses its future vision, economic growth, natural resource protection and development priorities.

Town and Village Comprehensive Community Master Plans

Most towns and villages in Seneca County have prepared community master plans that serve as a long range guide for growth and development. The master plans identify local goals and objectives that set the direction and focus for local decision making affecting land use, economic activity, community infrastructure and services. Provisions and goals outlined in these plans are reviewed when considering hazard mitigation projects and activities. The table in Section V of this plan outlines the status of local master plans.

Seneca County Hazard Analysis (HAZNY)

The HAZNY is part of the County Comprehensive Emergency Management Plan and is the tool used to identify, evaluate, rank and prioritize the natural and man-made hazards that can impact Seneca County. The HAZNY is equally essential to the Hazard Mitigation plan where it serves as the foundation for developing the comprehensive risk assessment. The HAZNY was first completed in 2008 and updated in 2015.

Public Health Emergency Operations Plan

The Seneca County Public Health emergency plan addresses special health preparedness considerations for public health emergencies, natural hazards, pandemic flu outbreaks and terrorist events that threaten safety and health. Planning undertaken for health emergencies is particularly valuable to the hazard mitigation planning process because the goals, strategies, data and information prepared in planning for health threats are key resources needed for implementing mitigation actions related to many hazards that have health impacts.

Seneca County Hazardous Material Plan

The Seneca County Hazardous Material Plan maintained by the Emergency Management Office and Local Emergency Planning Committee (LEPC) is required under provisions of the federal Superfund Amendments and Reauthorization Act (SARA) Title III and provides for a response to facilities that manufacture or use hazardous materials. In most situations, facilities must identify the types, amounts and locations of chemicals they use or store, and in other situations they must participate with the LEPC in planning for a chemical release or response at or near their site. The plan provides valuable background for the Multi-Jurisdiction Hazard Mitigation Plan by identifying risk areas and vulnerabilities related to hazardous materials and sets strategies and policies for mitigation of hazardous material threats.

NYS State Hazard Mitigation Plan, 2014

The State Hazard Mitigation Plan is an excellent resource that provides information and guidance for development of the Seneca County plan. Many communities across New York share similar experiences and vulnerabilities to hazards. The State Plan shows how exposure, preparedness and mitigation for many hazards are often similar from region to region, while at the same time demonstrating how certain areas and communities face specific concerns and have distinctive priorities.

Seneca County Housing Plan, 2011

Provides valuable data and analysis regarding the types of housing, income dispersion, population densities, residential patterns and trends for Seneca County.

Seneca County Agriculture and Farmland Protection Plan, 2011

Emphasizes the important role agriculture and farming play in the life and economy of Seneca County. Provides analysis about the type and extent of farm activity, as well as the impact farming has on land use. The plan also examines threats to farm operations and the future direction of agricultural in the community.

Seneca County Environmental Conservation Plan, 2014

Examines issues related to the future and protection of waterways, forests and natural features in Seneca County. The plan provides important analysis of wetlands, floodplains and steep slopes in the County, as well as information about recreational and cultural facilities, renewable energy and solid waste.

Economic Development Seneca County Economic Development Plan, 2014

This plan provides critical evaluation and analysis of key economic forces that influence much of Seneca County's growth and adaptive development. It examines job and employment trends, changing demands for land use, education and community services and infrastructure needs related to roads and transportation.

Discovery Report - Seneca River Watershed, HUC 04140201, FEMA, 2015

The Seneca Watershed Discovery Project seeks to increase public awareness of short and long-term flood risks and improve community protection from flood losses in the Seneca Watershed. The Discovery Report provides an overview of community flood protection strategies in the watershed and examines flood data and analysis available from the National Flood Insurance Program (NFIP) and other hydrologic and demographic factors that impact flooding in the watershed.

Other Relevant and Complimentary Plans

Cayuga Lake Watershed Restoration and Protection Plan,
Genesee/Finger Lakes Regional Planning Council

Seneca Lake Watershed Management Plan,
Genesee/Finger Lakes Regional Planning Council

Cayuga Lake Blueway Trail Plan
Cayuga, Seneca and Tompkins Counties

A Greenprint for Seneca County
Finger Lakes Land Trust

I. Coordination with Neighboring Counties and Plans

Throughout the planning process, Seneca County personnel met with and had regular discussions with the Emergency Managers and program officers in neighboring counties. These discussions included a review of common hazard mitigation concerns in area communities and helped to identify potential mitigation strategies, resources and projects.

Seneca County Emergency Management staff participated in regular monthly meetings of county emergency management staff in the Finger Lakes region. These meetings include the neighboring counties of Cayuga, Ontario, Schuyler, Tompkins and Wayne – as well as Chemung, Steuben, Toga and Yates counties. Representatives of the New York State Office of Emergency Management, NYS Department of Transportation and the National Weather Service also attend these meetings that regularly involve hazard mitigation planning and program topics.

County Highway personnel, local water supply, wastewater treatment and solid waste officials participate in regional meetings with their respective counterparts from other counties; where the State Department of Transportation (DOT), NYS Department of Environmental Conservation and State Health officers are present. Hazard Mitigation priorities, projects and funding related to roads, highways, bridges, local storm drainage and other public service systems are regularly discussed at these meetings.

County Public Health, Code Enforcement staff and representatives of the Seneca County Soil and Water Conservation District (SWCD) attend regional and statewide meetings and training where issues and topics related to hazard mitigation are commonly addressed.
Seneca County Planning and Development staff regularly meet with and are engaged in mitigation related discussions and projects with the Genesee/Finger Lakes Regional Planning Council and Southerntier Central Regional Planning and Development Board. Seneca planners are also involved in significant mitigation coordination in their work with regional partners on Cayuga and Seneca Lakes watershed management planning.

In preparing the Seneca County Multi-Jurisdiction Hazard Mitigation Plan, planning staff reviewed and referenced the hazard mitigation plans of other rural, upstate New York counties; including hazard mitigation plans prepared by Jefferson, Oswego, Schoharie, Tioga and Yates counties.

J. Citizen Participation

Website Information and Access

The draft 2017 Multi-Jurisdiction Hazard Mitigation Plan was posted on the Seneca County Emergency Management website for public access. It was announced at the meeting of the Seneca County Board of Supervisors that the draft plan is available for review on the County website and that comments can be submitted. Each town and village was also asked to announce publically that the plan has been posted on the County website and that input is sought.

Municipal Access

Sections of the Hazard Mitigation plan that apply to the specific goals and strategies prepared for that town or village were made available for public review and comment at each municipal office. Municipal officials were also asked to announce at local meetings and forums that sections of the plan prepared for their jurisdiction were available for public review at local offices and that the entire plan is posted on the County website.

Rather than presenting citizens with the entire draft Hazard Mitigation plan -- which can be thick, bulky and complex -- it was determined that making specific sections of the plan that target local goals and strategies would be a more effective means of promoting mitigation awareness and feedback.

Discussion at Public Meetings

As noted above, the Hazard Mitigation Planning Committee and planning team members encouraged municipal officials to seek public input and discuss the Hazard Mitigation plan at public meetings and forums whenever possible. While it is commonly acknowledged, and is described in the section below, that public participation was incorporated into the planning process, not all jurisdictions captured citizen participation activities in local records or reports.

The Steering Committee felt strongly that public input was essential to the planning process. Public involvement in the planning process ensures the identification of a wide range of problems and helps to promote community-wide support for the implementation of the plan.

Integrated Public Participation

The principal method for soliciting public participation in the hazard mitigation plan was through direct contact the planning team members had with citizens and community groups. Over the planning period, members of the Steering Committee, agency contacts and representatives of the participating jurisdictions were involved in discussions and listened to the views of interested parties throughout the county related to hazard mitigation needs, proposals and improvements. Most of these personal interactions were not recorded in reports or meeting minutes, but were shared and incorporated in the planning process as hazard mitigation goals and objectives were developed.

As noted in the introduction to this plan, Seneca County is sparsely populated and best known for its rural, small-town character. As a result of the strong community ties and integrated involvement of citizens and leaders among government and civic organizations, ample means and opportunities are available to insure the public has a say when it comes to the goals and content of the Hazard Mitigation Plan. Those responsible for preparing this Hazard Mitigation Plan - including members of the planning committee, agency leaders and representatives of the participating jurisdictions - are also members, or are associated with a wide range of boards, committees and public interest groups in the County. For example, Town Supervisors, Mayors and Highway Superintendents who participated in preparation of the Hazard Mitigation plan are elected by local residents with the specific intent that they will represent the interests of those citizens. Further strengthening the lines for feedback and cooperation is the recognition that local elected and agency officials in Seneca County, including those responsible for preparing the Hazard Mitigation Plan, are members of their local volunteer fire departments, civic and veterans clubs, school boards, planning and zoning boards and related community service organizations. This kind of integrated community networking and cross-cultural participation provide a valuable and very effective platform to insure that citizen participation is a fundamental part of the Hazard Mitigation Plan. In such a close-knit communal setting, many of the hazard mitigation objectives and actions listed in Section VI of this plan would have first been discussed at the kitchen tables of local citizens or at the village restaurants where members of the public and government leaders mingle.

The process to identify flood or other hazard concerns and a discussion of potential mitigation options typically begins as community leaders stand face-to-face with citizens and residents in the front yards of their neighborhoods. In most situations, a property owner or neighborhood group will contact the Highway Superintendent or a Town/Village Board member to identify a problem. From there, the issue will be put before the Town or Village Board and, if applicable, other organizations such as County Highways, Municipal Engineer or Soil and Water Conservation District will be brought in for consultation. At this stage, a local solution to hazards that citizens have identified are often available using community resources, but if a more

complex and expensive resolution involving other agencies and significant funding are required, it can then become a goal or local strategy that will be outlined in the Hazard Mitigation Plan.

Targeted Citizen Access and Input

Local officials in Seneca County believe the best opportunities for insuring citizen participation in the Hazard Mitigation process involve local government leaders and planning staff going directly to the people, often in one-on-one discussions with residents and neighbors, or at regular local meetings held at the town and village halls or fire stations. It was determined that public forums or citizen briefings specifically dedicated to presentation of the Hazard Mitigation Plan would not be an effective way to solicit public input because few residents have the time or expertise to read through a complex planning document and it is difficult for many citizens to articulate their opinions and concerns in a large and open community forum.

Citizens were present at regular Town Board meetings in Junius and Covert when Steering Committee members and the planning contractor provided briefings about updating the Hazard Mitigation plan. The residents attending these meetings were appreciative of the briefings and increased awareness of hazard mitigation issues, but they did not offer any input. It is likely, however, they would have talked with local officials after the meeting and offered suggestions or support, which is then reported to the Steering Committee and/or planning staff. Residents participated in some Steering Committees meetings where they were engaged in discussion about hazard mitigation improvement.

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Opportunities for Public Input	
January –June 2015	Citizens were present at early Steering Committee discussions
July – November 2015	Citizens are present when local officials are briefed at Town meetings about the Hazard Mitigation Plan and given an opportunity to make comments
September 2015 – November 2016	Residents and property owners are engaged in discussion of proposed Mitigation projects when the planning contractor makes on-site visits
March – April 2017	Residents have an opportunity to review and comment on the draft plan made available on the County's website
March – April 2017	Citizens have an opportunity to review the draft plan at the County Emergency Services Office and at Village and Town halls

Summary of Citizen Questions and Comments
Representative descriptions of citizen inquiries and input (edited for summary and clarity)
Residents identified flood problems and trouble spots, which municipal officials were generally already aware of, and if applicable, are included in Section VI goals and strategies.
Some made general comments saying it was good to see officials looking into flood problems. Others said the state and feds need to do more and that locals do not have the money.
Many used the opportunity for public input on the Hazard Mitigation Plan to ask if the plan would address concerns about sensitive local environmental issues, such as underground energy pipelines and proposed natural gas storage beneath Seneca Lake.
Folks asked or made comments about flood insurance, not necessarily based on their own experience, but that they are told it can be expensive and are not sure if it is required.
There were comments that debris from creeks and streams is no longer cleaned-out. It was said that in earlier times farmers cleaned the creeks, but now that farms are being sold or run by large companies it is not being done; and some say farmers don't clear debris because now you need a permit.
Citizens inquired if hazard mitigation work is an unfunded mandate and if it means there will be added costs for their town government.

K. Local Adoption

Note: Local adoptions will be scheduled in 2017 after the draft plan is reviewed by FEMA and any modifications are completed

FEMA completed their review of the content and provisions of the updated Seneca County Multi-Jurisdiction Hazard Mitigation Plan in_____2017 and notified the county that the plan is '*Approved Pending Adoption'*. This pending approval indicates that the plan meets federal hazard mitigation planning requirements and standards and that final FEMA approval will be granted after the Seneca County Board of Supervisors and each of the town and village boards adopt the plan and submit their approved local resolution to the county.

The sample adoption resolution and each of the approved local adopting resolutions (when available) are included in Appendix 4.

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Section III Risk Assessment

A. Program and Method

Seneca County performed the risk assessment and all-hazard analysis using the New York State Emergency Management Office *Hazard Analysis - New York (HAZNY)* program, which was supplemented by the U.S. Department of Homeland Security's *Threat and Hazard Identification and Risk Assessment (THIRA)* and hazard research performed by the planning committee. The HAZNY was performed on a county-wide basis, and also prepared for each of the County's jurisdictions where unique concerns and threats were identified.

A joint meeting was held with the Hazard Mitigation Steering Committee (HMPC) and the Local Emergency Planning Committee (LEPC) that used *HAZNY and THIRA* to begin revision of the Risk Assessment for this updated Hazard Mitigation plan. The HAZNY and THIRA are used to examine the kinds of hazards that could potentially affect Seneca County and serve as building blocks for the comprehensive risk assessment included in this section.

The following factors were considered in the HAZNY analysis that examines potential hazards.

1) **Where could the hazard occur**

   a) a large region (affecting an area greater than half of the municipality) a
   b) small region (affecting an area one third to one half the municipality)
   c) several individual locations
   d) a single location.

2) **How often does the hazard occur -** historical data was analyzed to determine how often a hazard occurred in the municipality.

   a) a rare event (less than once every fifty (50) years), an infrequent event (once every eight (8) to fifty (50) years)
   b) regular event (once a year to once every seven (7) years)
   c) frequent event (more than once a year)

3) **What are the cascade effects -** the HAZNY asked "Could the hazard trigger another hazard"? For example, a flood can trigger a hazardous materials release, or a severe storm will result in a power outage.

4) **How will the hazard impact the population, private property and public infrastructure?**

a) serious injury or death is unlikely
b) death or injury is likely but not in large numbers
c) death or injury is likely in large numbers
d) death or injury is likely to extremely large numbers

5) **Damage options are selected for private and public property:**

a) 'Little' is defined as either …

b) a significant number of structures still habitable or useable but in need of minor repair,

or

c) severe damage to a very limited number of structures

d) 'Moderate' means the property is not habitable or useable, but can be repaired – and 'moderate' can mean there was damage to a sizeable number (a quarter) of structures in the area

e) 'Severe' is defined as a total loss and a sizeable number of structures must be replaced.

6) **How much warning will you receive -** options include:

a) no warning,
b) several hours,
c) one day,
d) several days,
e) more than a week.

(7) **How long will the hazard remain active -** options included:

f) less than one day
g) one day
h) two to three days,
i) four days to a week
j) more than one week

8) **How long will emergency operations continue -** options included:

k) less than one day,
l) one to two days,
m) three days to a week,
n) one to two weeks,
o) more than two weeks.

Risk Assessment Data Collection and Analysis

In addition to the HAZNY, historical and statistical data of disaster occurrences and damages has been compiled, analyzed and included in this section. Sources primarily include records and data from the following sources.

- National Weather Service (NWS)
- National Climate Data Center (NCDC)
- U.S. Geological Survey (USGS)
- Federal Emergency Management Agency (FEMA)
- National Flood Insurance Program (NFIP)
- New York State Hazard Mitigation Plan (2014)
- Seneca County Planning and Community Development
- Seneca County Emergency Management
- Seneca County Soil and Water Conservation District (SWCD)
- New York State Department of Environmental Conservation (DEC)
- New York State Department of Transportation

B. Hazard Definitions

The Seneca County HAZNY evaluated thirty-two (32) potential hazards. Listed below are the definitions of potential hazards as identified in the New York State Hazard Mitigation Plan, which are endorsed by the National Weather Service (NWS) and used in the New York State HAZNY.

Active Shooter: an individual who is actively engaged in killing or attempting to kill people in a school, institution, business or public place. In most cases active shooters use one or more firearms, exhibit a random pattern in their actions and are indiscriminate in their selection of victims.

Air contamination: This is pollution caused by atmospheric conditions, (as opposed to a chemical spill or release type of situation) such as a temperature inversion induced smoggy condition sufficiently serious to create some danger to human health.

Avalanche: A mass of sliding snow, which usually occurs in mountainous terrain where snow is deposited on slopes of twenty (20) degrees or more.

Blight: A disease of agricultural crops or non-agricultural plants resulting in withering, lack of growth, and death of its parts without rotting.

Civil Unrest: An individual or collective action causing serious interference with the peace, security, and/or functioning of a community (e.g., riot).

Dam Failure: Structural deterioration, either gradual or sudden, resulting in the facility's inability to control impounded water as designed, and posing a danger to people and/or property in the potential inundation area.

Drought: A prolonged period of limited precipitation affecting the supply and quality of water.

Earthquake: A sudden motion of the ground caused by release of subterranean strain energy, due to plate tectonics, resulting in surface faulting (ground rupture), ground shaking, or ground failure (collapse).

Epidemic: The occurrence or outbreak of disease to an unusual number of individuals or proportion of the population, human or animal.

Explosions: The threat or actual detonation of an explosive device or material with the potential of inflicting serious injury to people or damage to property.

Extreme Temperature: Extreme Heat is sustained periods when the heat index is 100 degrees or greater, or when sustained nighttime temperatures exceed 80 degrees. **Extreme Cold** is sustained periods with windchills of minus-20 degrees and colder.

Fire: Uncontrolled burning or fire hazards in developed areas, or where populations and structures are at risk.

Flooding: Flooding usually is a natural, cyclic occurrence in existing water bodies. When a water body overflows its 'normal' banks, a potentially violent and/or destructive waterway can form. A flash flood is a sudden transformation of a small stream into a violent waterway after heavy rain and/or rapid snowmelt.

Food Shortage: A situation where the normal distribution pattern and/or the timely delivery of foodstuffs to retail establishments for normal consumer demand is interrupted for a substantial period of time.

Fuel Shortage: A situation in which the normal quantity and/or timely delivery of fuel supplies to distributors and retail establishments are interrupted.

Hazardous Materials - Fixed Sites: The uncontrolled release of material from a stationary facility, which when released can result in death or injury to people and/or damage to property and the environment through the material's flammability, toxicity, corrosiveness, chemical instability and/or combustibility.

Hazardous Materials - In Transit: The uncontrolled release of materials during transport, which when released can result in death or injury to people and/or damage to property and the environment through the material's flammability, toxicity, corrosiveness, chemical instability and/or combustibility.

Hurricane / Tropical Storms - Severe: Tropical cyclones, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or "eye." Circulation is counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Ice Jam: Large accumulation of ice in rivers or streams interrupting the normal flow of water and often leading to flooding conditions and/or damage to structures.

Ice Storm: Freezing rain that accumulates as a substantial glaze or heavy layer of ice ¼ inch or greater.

Infestation: Excessive populations of insects, rodents or other animals requiring control measures due to their potential to carry diseases destroy crops or harm the environment.

Landslide: The downward and outward movement of slope-forming materials reacting to the force of gravity. Slide materials may be composed of natural rock, soil, artificial fill, or combinations of these materials. The term landslide is generalized and includes rockfalls, rockslides, creep, block glides, debris slides, earth-flow, mudflow, slump, and other similar terms.

Land Subsidence: The sudden sinking or gradual downward settling of land with little or no horizontal motion, caused by a loss of subsurface support which may result from a number of natural and human caused occurrences including subsurface mining or the pumping of oil or ground water. Land subsidence events, depending on their location, can pose significant risks to health and safety, or interruption to transportation and other services.

Mine Collapse: The folding, caving-in or sudden implosion of an underground cavity. Such an event would threaten persons inside the cavity and/or persons, property and structures on the surface.

Oil Spill: Uncontrolled or accidental discharge of petroleum products to water or land.

Radiological - Fixed Site: A release or threat of release of radioactive material from a nuclear power generating station or research reactor or other stationary source of radioactivity.

Radiological – In Transit: A release or threat of release of radioactive material from a transportation vehicle including truck, rail, air, and marine vehicle.

Structural Collapse: A sudden structural failing, partial or fully, of buildings, bridges or tunnels, threatening human life and health.

Terrorism: The threat or use of violence to achieve political/social ends usually associated with community disruption and/or multiple injuries or deaths

Tornado: A local atmospheric storm, generally of short duration, formed by winds rotating at very high speeds, usually in a counterclockwise direction. The vortex, up to several hundred yards wide, is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity of funnel. Winds have been estimated to be as high as 400 miles per hour.

Transportation Accidents: A mishap involving one or more conveyances on land, sea, and/or air that results in mass casualties and/or substantial loss of property.

Water Supply Contamination: The contamination or potential contamination of surface or subsurface public water supply by chemical or biological materials that results in restricted or diminished ability to use the water source.

Wildfire: An uncontrollable combustion of trees, brush, or grass involving a substantial land area that has the potential for threatening human life and property

Winter Storm - Severe: When there is a storm or extended periods and amounts of freezing or frozen precipitation (freezing rain, sleet, snow), or the combined effects of winter precipitation and strong winds. Includes snowfalls of 6 inches or more in 12 hours, or 8 inches or more in 24 hours. Also includes blizzards where sustained winds or frequent gusts of 35 mph or greater are combined with snow or blowing snow and visibility is reduced to 1/4 mile or less for a period of three hours or more, and sleet accumulating ½ inch or more.

Severe Storm: A thunderstorm which can produce damaging tornadoes, lightning and hail 0.75 inches or more in diameter, and/or winds of 58 mph or more. Structural wind damage may imply the occurrence of a severe thunderstorm.

Tsunami: A large sea wave produced by subocean earth movement, earthquake, or volcanic eruption; historically very rare in the Atlantic Ocean.

Utility Failure/Long-Term Power Outage: Any sustained, long-term interruption or loss of electrical, natural gas, telecommunications and/or water supply service; caused by accident, sabotage, natural hazards, technological or equipment failure.

C. Hazard Rankings

The HAZNY applies a numerical rating from 0 to 400 for each hazard based on the criteria noted in Section A above, and then ranks hazards in the following groups.

High Hazard	**to 400**
Moderately High Hazard	**to 320**
Moderately Low Hazard	**to 240**
Low Hazard	**44 to 160**

The Seneca County HAZNY, updated for the 2017 Hazard Mitigation Plan, ranked the hazards as follows. Additional man-made hazards that were included in the THIRA analysis were applied using the HAZNY criteria and ratings, producing the consolidated rankings below.

Two (2) hazards were ranked as **'High Hazards'** -- to be ranked a high hazard means that death and injury are likely in high numbers and the event would have widespread catastrophic impacts. These are considered *'Hazards of Concern'*.

High Hazards	Rating	Rank
FIRE	335	High Hazard
SEVERE STORMS	335	High Hazard

Ten (10) hazards were ranked as **'Moderately High'** – which means that death and injuries are likely, and that damages and impacts could have severe consequences for the community. These would also be considered *'Hazards of Concern'*.

Moderately High Hazard	Rating	Rank
HAZRDOUS MATERIALS – IN TRANSIT	313	Moderately High
CIVIL UNREST	293	Moderately High
ICE STORM	291	Moderately High
HAZARDOUS MATERIALS – FIXED SITE	284	Moderately High
FLOOD	283	Moderately High
TORNADO	280	Moderately High
WATER SUPPLY CONTAINATION	275	Moderately High
WINTER STORM	268	Moderately High
TERRORISM	268	Moderately High
EPIDEMIC	257	Moderately High

The HAZNY ranked nine (9) hazards as **'Moderately Low'** – which means the event poses significant risks for a community, particularly for locations or areas where it occurs; but widespread consequences and numerous deaths and injuries are not likely.

Hazard	Rating	Rank
UTILITY FAILURE	236	Moderately Low
TRANSPORTATION ACCIDENT	232	Moderately Low
STRUCTURAL COLLAPSE	218	Moderately Low
ACTIVE SHOOTER	211	Moderately Low
EXPLOSION	211	Moderately Low
DAM FAILURE	203	Moderately Low
LANDSLIDE	196	Moderately Low
BLIGHT	193	Moderately Low
EXTREME TEMPERATURES	190	Moderately Low
EARTHQUAKE	187	Moderately Low

The following nine (9) hazards were ranked as **'Low'** hazards – which are those having little chance of occurring, or if there is an event they are not expected to have a significant impact on the community.

Hazard	Rating	Rank
WILDFIRE	159	Low
OIL SPILL	158	Low
FOOD CONTAMINATION	158	Low
ANIMAL DISEASE	155	Low
AIR CONTAMINATION	152	Low
FUEL SHORTAGE	150	Low
RADIOLOGICAL - IN TRANSIT	142	Low
RADIOLOGICAL - FIXED SITE	117	Low

The Planning Committee also considered evaluating *'liquid manure'* that is produced and stored on area farms as a separate and distinct hazard, but it was determined that threats associated with this substance were covered under categories for hazardous materials and contamination.

Hazards Likely to Occur Most Often

Flood	Winter Storm	Transportation Accident
Severe Storm	Utility Failure	Fire

Hazards That Can Occur with Little or No Warning

Dam Failure	Terrorism	HazMat - In Transit
Oil Spill	Fire	Water Supply Contamination
Active Shooter	Utility Failure	Transportation Accident
Explosion	HazMat – Fixed Site	Earthquake
Landslide	Wildfire	Structural Collapse
Radiological - In Transit	Radiological – Fixed Site	Tornado

Hazards That Pose the Greatest Threat to Life

Tornado	HazMat - In Transit
Transportation Accident	Terrorism
Active Shooter	

When examining all types of hazards (natural, technological and man-made) the following hazards have been identified as those requiring an increased emphasis on planning and preparedness. These hazards represent those the HAZNY determined to be *High Hazards*, *Moderately High Hazards*, or *Hazards that Pose the Greatest Threat to Life*.

Hazards That are Planning and Preparedness Priorities	
All-Hazard Types (Natural, Technological and/or Man-Made)	
Fire	Flood
Severe Storm	Tornado
Ice Storm	Active Shooter
Hazardous Materials In-Transit	Winter Storm
Hazardous Materials – Fixed Site	Epidemic
Water Supply Contamination	Terrorism
Transportation Accident	Civil Unrest

HAZNY Results for the Towns and Villages

Jurisdiction	**Natural Hazards of Concern** Ranked 1 - 4		**Other Natural Hazard Priorities***
Covert	1) Flood 2) Ice Storm	3) Winter Storm 4) Severe Storm	Landslide
Fayette	1) Flood 2) Ice Storm	3) Winter Storm 4) Severe Storm	
Interlaken	1) Winter Storm 2) Ice Storm	3) Flood 4) Severe Storm	
Junius	1) Severe Storm 2) Winter Storm	3) Ice Storm 4) Flood	
Lodi, Town	1) Flood 2) Severe Storm	3) Ice Storm 4) Winter Storm	Landslide
Lodi, Village	1) Ice Storm 2) Winter Storm	3) Flood 4) Severe Storm	
Ovid, Town	1) Flood 2) Ice Storm	3) Severe Storm 4) Winter Storm	Landslide
Ovid, Village	1) Ice Storm 2) Flood	3) Severe Storm 4) Winter Storm	
Romulus	1) Ice Storm 2) Flood	3) Severe Storm 4) Winter Storm	Landslide
Seneca Falls	1) Flood 2) Ice Storm	3) Severe Storm 4) Winter Storm	Tornado Dam Failure
Tyre	1) Flood 2) Severe Storm	3) Ice Storm 4) Winter Storm	
Varick	1) Flood 2) Winter Storm	3) Severe Storm 4) Ice Storm	
Waterloo, Town	1) Flood 2) Ice Storm	3) Severe Storm 4) Winter Storm	Tornado
Waterloo, Village	1) Ice Storm 2) Flood	3) Severe Storm 4) Winter Storm	Tornado Dam Failure

* See next page

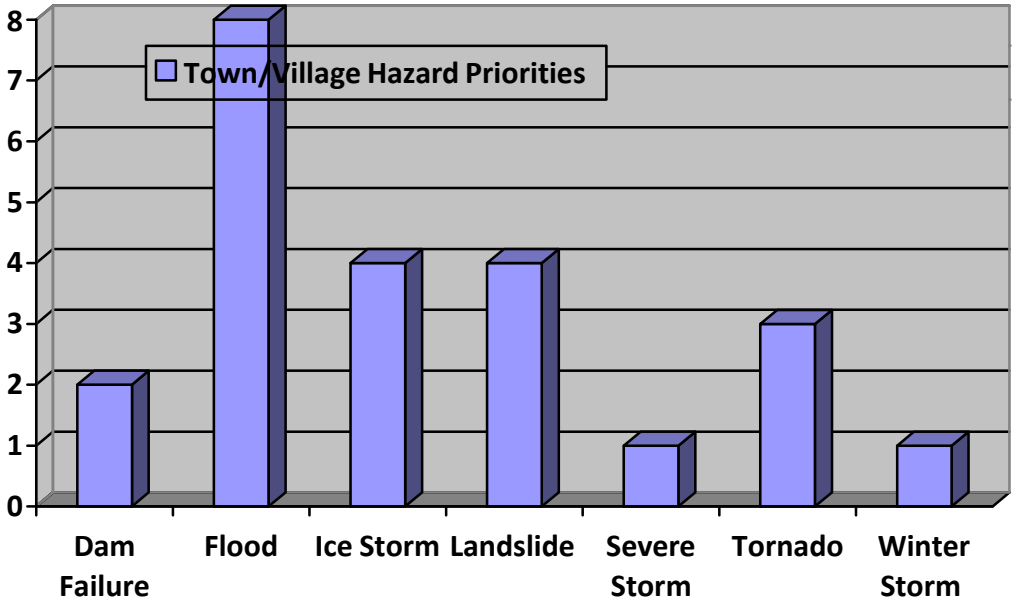
***** See Part D. **Natural Hazard Planning Priorities** that follows on the next page for a discussion of other natural hazards. Landslide hazards were evaluated in the southern towns, but in these areas they are considered a secondary hazard when flooding occurs and landslides were not determined to be a *Hazard of Concern* independent of flooding. Tornados and Dam Failure were considered to be greater risks for the Villages of Waterloo and Seneca Falls, but were not distinguished as *Hazards of Concern*. Structure Fires were a high-profile hazard in most jurisdictions, but for this planning they are considered a Man-Made, not Natural Hazard.

Town/Village Hazard Rankings Compared with County Rankings

There is agreement that Floods, Ice Storms, Winter Storms and Severe Storms are *Hazards of Concern* for all jurisdictions. The County analysis considers tornados to be a risk county-wide, but it was determined that the risk for severe tornados is greater for the Villages/Towns of Seneca Falls and Waterloo; not because of historical frequency or natural factors, but due to increased vulnerability linked to higher density populations and development. Landslides and Dam Failure are specific to certain jurisdictions and Earthquake was only evaluated in the County analysis.

Below are the County-wide analysis and the collective Town/Village ranking of these five natural hazards of concern.

County Analysis	Collective Town Village Ranking
1) Severe Storm	1) Flood (8)
2) Ice Storm	2) Ice Storm (4)
3) Flood	3) Tornado (3)
4) Tornado	4a) Severe Storm (1)
5) Winter Storm	4b) Winter Storm (1)


Town/Village Hazard Priorities
8
7
6
5
4
3
2
1
0
Dam Failure
Flood
Ice Storm
Landslide
Severe Storm
Tornado
Winter Storm

D. Natural Hazard Planning Priorities

Hazards Selected for Further Assessment and Planning

The purpose of the Hazard Mitigation Plan and the priorities set forth in the federal Disaster Mitigation Act of 2000 are to focus on establishing mitigation measures and improvements that will reduce the impacts and costs associated with natural hazards. For that reason, the hazard and risk assessment portion of this plan targets natural hazards that pose the greatest threat to the community. The process for determining which hazards are targeted for this evaluation -- those identified as '**Hazards of Concern'** -- is outlined next.

> ***Hazards of Concern*** are defined as those natural hazards considered most likely to impact a community. A *Hazard of Concern* may be identified when the HAZNY or a similar data supported analysis determines a hazard poses a significant threat or risk to the community and/or the community has a high vulnerability to the hazard. H*azards of Concern* can also be designated when knowledgeable local authorities or those with special experience and historical perspective determine that a hazard poses a high degree of concern.

The following are commonly defined *Natural Hazards* as listed in various FEMA publications and guidance documents.

Flood	**Severe Storms** (Windstorm, Thunderstorms, Hail and Lightning)
Tornado	**Coastal Storms** (Hurricanes, Tropical Storm, Coastal Erosion)
Earthquake	**Winter Storm** (Extreme Cold, Blizzard, Avalanche)
Extreme Heat	**Land Subsidence** (Sink Hole)
Drought	**Landslide** (Slope Failure)
Wildfire	**Tsunami**
Volcano	

The following natural hazards have been targeted as ***'Hazards of Concern'*** for Seneca County and are further analyzed in the hazard assessment and profiles of this plan because they were ranked by the HAZNY analysis as *'High' or 'Moderately High'* hazards, or they were identified as '*Hazards that Pose the Greatest Threat to Life'*.

Seneca County – Hazards of Concern	
Severe Storm	Winter Storm
Tornado	Flood
Ice Storm	

The Hazard Mitigation Steering Committee also considered other natural hazards that were ranked 'Moderately Low' or 'Low' in the County's HAZNY evaluation to determine if there were conditions or risks that might otherwise define any as a *Hazard of Concern*. Generally, these hazards have rarely occurred in Seneca County, or an occurrence is not expected to have significant consequences. Still, these hazards were evaluated to determine if one of the following three (3) criteria might require a closer examination of the hazard.

1) they have occurred elsewhere in upstate New York State in recent years and resulted in serious consequences for other New York communities that have geographic and risk profiles similar to Seneca County
2) if an event related to these hazards does occur in Seneca, it could have potentially significant consequences for the community
3) it was identified as a more serious concern by many of the HAZNY evaluations performed for the towns and villages and the planning committee determined that the hazard should also be included in the hazard assessment and planning process

This evaluation did not identify additional hazards that would be defined as natural *Hazards of Concern*. The analysis of these remaining hazards that was undertaken to make this determination follow in the pages below.

The process of identifying Hazards of Concern is an important step in determining which hazards will be targeted for the more comprehensive risk assessment and vulnerability analysis outlined in Sections IV thru VI of this plan. Looking at the natural hazards that were ranked by the *HAZNY* as 'Moderately Low' or 'Low' and were not identified as *Hazards of Concern,* ***Earthquake*** was singled out by the Steering Committee as a hazard that still required greater consideration. And while **Earthquake** is not defined as a *Hazard of Concern*, it has been included in the more comprehensive profiling that follows in Sections IV.

Hazards Addressed by Other Plan Considerations

Hurricane and Tropical Storm – An evaluation and assessment of Hurricane and Tropical Storm was not included in this analysis. Once a hurricane or tropical storm moves inland to central New York and the Finger Lakes it lacks the storm surge and hurricane force winds that are unique to coastal storms. Such events are therefore considered a 'Flood' or 'Severe Storm' hazard characterized by high winds and/or flooding.

Utility Failure is commonly a secondary hazard associated with a natural hazard like severe storms or tornados, or a man-made condition such as a technology failure, transportation accident or terrorism. For that reason, utility failure is not evaluated in this Risk Assessment section as an independent hazard. Utility Failure is, however, considered in the Section V Vulnerability Assessment because power outages or other utility disruptions linked to a natural hazard can often have overwhelming community impacts that sometimes surpass those accompanying the underlying hazard.

Evaluation of Natural Hazards Not Selected for Analysis as Hazards of Concerns

The following summary evaluations are provided for the eleven (11) remaining natural hazards that were ranked as 'Moderately Low' and 'Low', but because they did not meet any of the criteria that would define them as '*Hazards of Concern*', they were not targeted for further evaluation in this plan**.**

Hazard	**Air Contamination**
Impact Area	Countywide
History	Rare
Determining Factors	The rural character and limited industrial activity in Seneca County minimizes any serious threat or community impacts. Air quality issues are more commonly linked to personal respiratory problems associated with pollen or man-made pollutants.

Hazard	**Avalanche**
Impact Area	NA
History	None
Determining Factors	The steeply sloped areas of Seneca County are heavily forested and vegetated, and along with climatic factors associated with the Finger Lakes region topography, the snow pack and risk associated with an avalanche are minimal. Developed residential areas are primarily located in the lower, less steeply sloped environs.

Hazard	**Dam Failure**
Impact Area	Areas near the Seneca Canal in Seneca Falls and Waterloo
History	No dam failures, but instances of overtopping or diversion when precipitation is excessive
Determining Factors	*Synopsis:* There are ten (10) dams in Seneca County listed on the NYS Department of Environmental Conservation (DEC) Dam Inventory. Seven (7) of these dams are Class 0 and Class A dams, which are primarily farm or single user power production dams in low-density rural areas. A dam failure at these low-profile structures would result in minor local flooding to open space, roadways and nearby structures, but would not cause significant or widespread community disruption for people and property. Three (3) dams are classified by DEC as Class C 'High Hazard' dams where a failure may result in threats to life, widespread economic loss and/or serious damage to homes, businesses, infrastructure and the environment. The following are classified as 'High Hazard Dams'. 1. Mud Lock – NYS Cayuga-Seneca Canal Seneca River at Cayuga Lake, Town of Seneca Falls Used for flood control and storm water management 2. Seneca Falls Dam – NYS Cayuga-Seneca Canal Seneca River, Town of Seneca Falls Used for hydro-power and navigation 3. Waterloo Dam – NYS Cayuga-Seneca Canal Seneca River, Town of Waterloo Used for hydro-power, water supply and navigation

	Events: Flooding associated with these Class C High Hazard Dams has never been the result of structural dam failure, but flooding does occur during periods of heavy rain when water levels above or below the dams overtop barriers and channel banks. For example, flooding occurred in the vicinity of Mud Lock in 1996 when rain and snowmelt dramatically raised the level of Cayuga Lake in just a few days. Canal authorities and managing power companies at these dams can retain or release water through these dams within pre-established parameters, but in periods of heavy precipitation such controls are limited in their ability to prevent flooding. Flooding occurred in Seneca Falls and Waterloo in 2011 and 2014, and while the structural integrity and safety of the dams were not threatened, the minimal flood control capabilities of the dams are unable to fully prevent Seneca River floodwaters from inundating adjacent streets and properties. *Determination:* The Mud Lock Dam is designed to provide a certain measure of flood control, but the Seneca Falls and Waterloo Dams are intended for hydro-power and navigation use, not flood control. While each of these dams can manage water flow within a set range and according to established policies, they are not able to fully manage water volumes during excessive rains and substantial precipitation. When flooding occurs in the vicinity of these dams, it is the result of heavy rains and snowmelt and the dams are not the hazard. The dams -- like other buildings, roads and infrastructure can influence flooding in both positive and negative ways, but the flood threats or risks are not linked to the structural integrity of the dam or concern for dam failure. It is therefore determined that threats and hazards associated with the dams should appropriately be addressed in the sections of this plan that cover flooding. State Canal and power company authorities that operate these dams are responsible for maintenance, monitoring and safety at these dams, and they must comply with state and federal regulatory measures, including the preparation of dam safety plans. From a design, structural and maintenance perspective, a dam failure at any of these facilities is considered unlikely and was evaluated to be a moderately-low hazard and not designated a Hazard of Concern.

Dam Safety Classifications

The NYS Department of Environmental Conservation (DEC) Hazard Classifications for dams are assigned based on the particular physical characteristics of a dam, its location and potential hazards and is not necessarily related to the size of the dam. The hazard classification represents the consequences of a dam failure and is not a representation of a dam's condition.

Class 'A' or 'Low Hazard' dam: A dam failure is unlikely to result in damage to anything more than isolated or unoccupied buildings, undeveloped lands, minor roads such as town or county roads; is unlikely to result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; and/or is otherwise unlikely to pose the threat of personal injury, substantial economic loss or substantial environmental damage.

Class 'B' or 'Intermediate Hazard' dam: A dam failure may result in damage to isolated homes, main highways, and minor railroads; may result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; and/or is otherwise likely to pose the threat of personal injury and/or substantial economic loss or substantial environmental damage. Loss of human life is not expected.

Class 'C' or 'High Hazard' dam: A dam failure may result in widespread or serious damage to home(s); damage to main highways, industrial or commercial buildings, railroads, and/or important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; or substantial environmental damage; such that the loss of human life or widespread substantial economic loss is likely.

Class 'D', (or Class '0' in the Inventory/Database) 'Negligible or No Hazard' dam:
A dam that has been breached or removed, or has failed or otherwise no longer materially impounds waters, or a dam that was planned but never constructed. Class "D" dams are defunct dams posing negligible or no hazard.

Requirements for Owners of Class C - High Hazard Dams

DEC Requires Owners of Class C - High Hazard dams to:

- Submit an Annual Certification to DEC
- Have an Emergency Action Plan prepared by a Professional Engineer and submit the plan to DEC.
- Develop and implement an Inspection and Maintenance Plan.
- Have an Engineering Assessment (EA) conducted by a Professional Engineer and submit the Report to DEC every 10 years.
- Have a Safety Inspection conducted by a Professional Engineer on a regular schedule as defined in the Inspection and Maintenance Plan.
- Report flows in erodible auxiliary spillways to DEC within 5 days.

There are no Class B dams in Seneca County

Operators of all dams must maintain the dam and all appurtenant structures in a safe condition and maintain in good order all available records regarding the dam, and provide those records to any new owner.

Hazard	**Drought**
Impact Area	Countywide
History	Three (3) minor or moderate drought events in the last 50 years, primarily affecting agricultural and well water users.
Determining Factors	*Synopsis:* Water supplies are generally more sustainable throughout Seneca County due to the balanced climate factors and abundant water sources that exist in the Finger Lakes and Great Lakes watersheds. Potential drought conditions and threats are monitored closely, however, because the rural areas of Seneca County rely on local sources of ground water, wells and springs. Droughts often affect various elements of a community in different ways through the phases of a drought cycle; agriculture and those relying on private wells first, then restrictions on business and institutions, and finally impacts on public water supply and quality. *Events*: Drought conditions are not common in Seneca County and have been considered minor or moderate. The most recent drought warning was issued in 2016, resulting in the application of conservation measures, restricted well supplies, assistance to agricultural users and concerns about fire protection. Droughts also occurred in 1994 and 1999. While these droughts have had economic consequences and created short-term disruptions in the community, none resulted in deaths, injuries or extensive losses to property and infrastructure. *Determination*: The county's sparse population and the ability to share limited resources when water shortages occur make it less vulnerable to droughts. Droughts occurring in Seneca County do not typically result in widespread property losses or threats to health and, at most, pose a low or moderate threat in Seneca County.

The Four Drought Stages and What They Mean

The New York State Drought Plan describes the actions to be taken during each drought stage by water purveyors, towns and villages, water authorities, and other agencies with water supply responsibilities.

- **Drought Watch** - The least severe of the stages, a drought watch is declared when a drought is developing. Public water suppliers begin to conserve water and urge customers to reduce water use.

- **Drought Warning** - Voluntary water conservation is intensified. Public water suppliers and industries update and implement local drought contingency plans. Local agencies make plans in case of emergency declaration.

- **Drought Emergency** - The Governor may declare emergency. The Disaster Preparedness Commission coordinates response. Mandatory local/county water restrictions may be imposed. Communities may need to tap alternative water sources to avoid depleting water supplies, protect public health and provide for essential uses.

- **Drought Disaster** - Disaster plans are implemented. Water use is further restricted. The Governor may declare disaster and request federal disaster assistance. Emergency legislation may be enacted. The state provides equipment and technical assistance to communities.

Hazard	**Extreme Temperatures**
Impact Area	Countywide
History	2 events with minimal impacts over the last 50 years
Determining Factors	*Synopsis:* Extreme hot and cold conditions can pose temporary problems for certain individuals and segments of the local population, but they never create the kind of impacts and or extent of losses that would define them as a community disaster. The elderly and those with compromised health can be vulnerable to prolonged heat, but the number of people not able to obtain relief is small and community services are organized during hot periods to aid them. Seniors and others who are vulnerable in unusually cold periods are similarly helped through community programs. There is virtually no homeless population in Seneca County and a degree of community protection from extreme temperatures exists across the population due to the local emphasis on independent living that characterizes this and other rural, community oriented counties. Many residents in Seneca County heat with wood, fuel oil and other independent heating fuel sources. The climate of the Finger Lakes region is also more

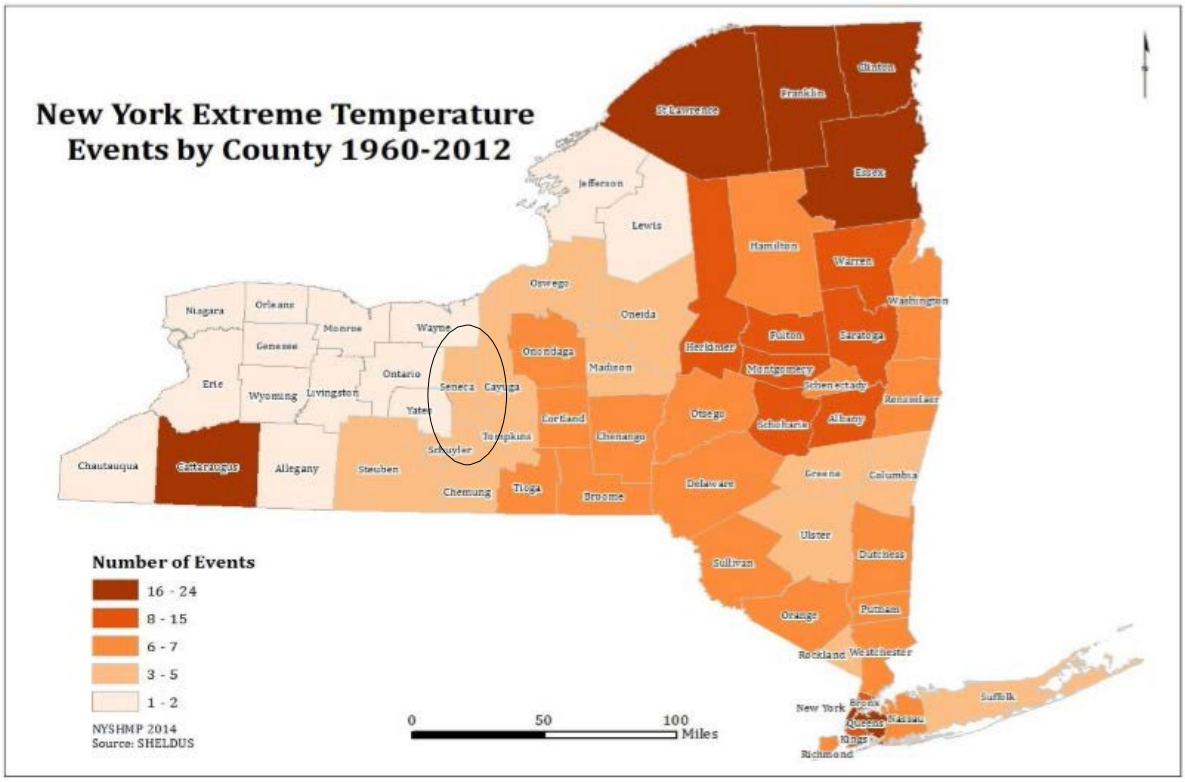
	temperate and less susceptible to prolonged temperature extremes than urban areas and other regions of the nation. *Events:* Excessive hot or cold periods, where community services are activated to aid sensitive citizens occur almost every year. Temperature extremes that result in death, increased EMS response and multiple hospitalizations are rare. In the past 20 years, National Weather Service records note that Seneca County experienced one (1) extreme heat event in 2011, and one (1) extreme cold/wind chill event in 2000. *Determination:* Other practical problems occur during extreme temperature periods; such as electrical restrictions, lost productivity, water line ruptures, increased medical and health care services, plus stress on animals and livestock. While extreme heat is a significant health threat nationally, dealing with extreme temperatures is not considered a significant vulnerability for Seneca County.

National Weather Service criteria for Heat Advisories, Watches and Warnings

Alert	Criteria
Heat Advisory	Issued 12-24 hours before the onset of the following conditions: heat index of at least 100F but less than 105F for at least 2 hours per day.
Excessive Heat Watch	Issued by the National Weather Service when heat indices of 105ºF (41ºC) or greater are forecast in the next 24 to 72 hours.
Excessive Heat Warning	Issued within 12 hours of the onset of the following criteria: heat index of at least 105°F for more than 3 hours per day for 2 consecutive days, or heat index more than 115°F for any period of time

Source: NOAA, National Weather Service

Note: This table uses the heat index measurement, which is based on the relationship between the temperature and relative humidity



Source: NYS Hazard Mitigation Plan (2014)

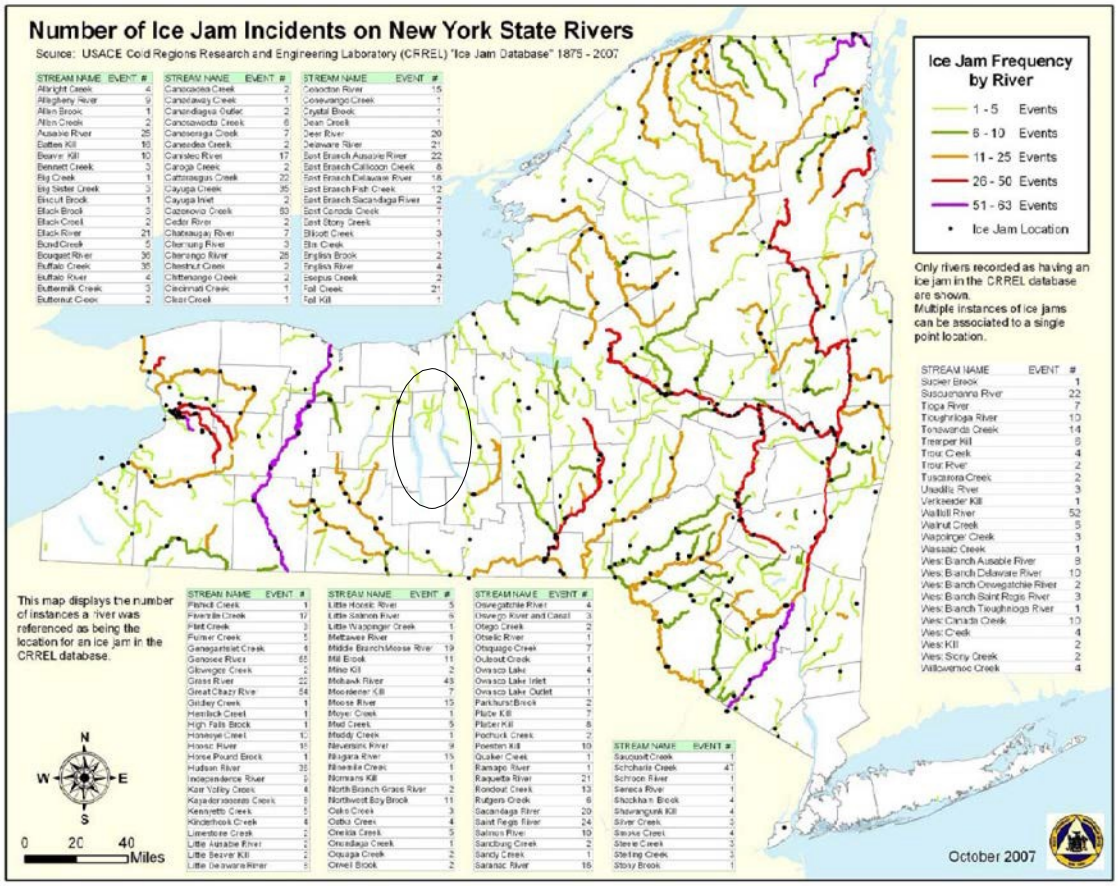
Population Vulnerable to Extreme Temperatures

Situational and physical characteristics help to identify vulnerable populations that are more at risk in an emergency and may require special help or resources. In periods of extreme heat or cold, the following groups could be more vulnerable or at greater risk.

- Homeless
- Infants and small children under age five
- Women who are pregnant
- Elderly people (age 65 and older)
- Persons who have obesity
- Persons who are bedridden
- Persons with mental illness/disabilities
- Persons with cognitive disorders
- Persons with medical conditions (e.g., heart disease, diabetes, high blood pressure)
- Persons requiring life-saving medications (e.g., for high blood pressure, depression, insomnia)
- Persons who utilize medical equipment (e.g., ventilators, oxygen, G-tubes)

- Individuals with drug or alcohol addictions
- Persons who use mobility devices (e.g., wheelchairs, walkers, canes)
- Persons who are non-ambulatory
- Those with sensory impairments (blind/visually impaired or deaf/hard of hearing)
- Persons who are under extreme working conditions
- Persons who are poor
- Persons who are socially isolated
- Persons who do not speak English with minimal access to information

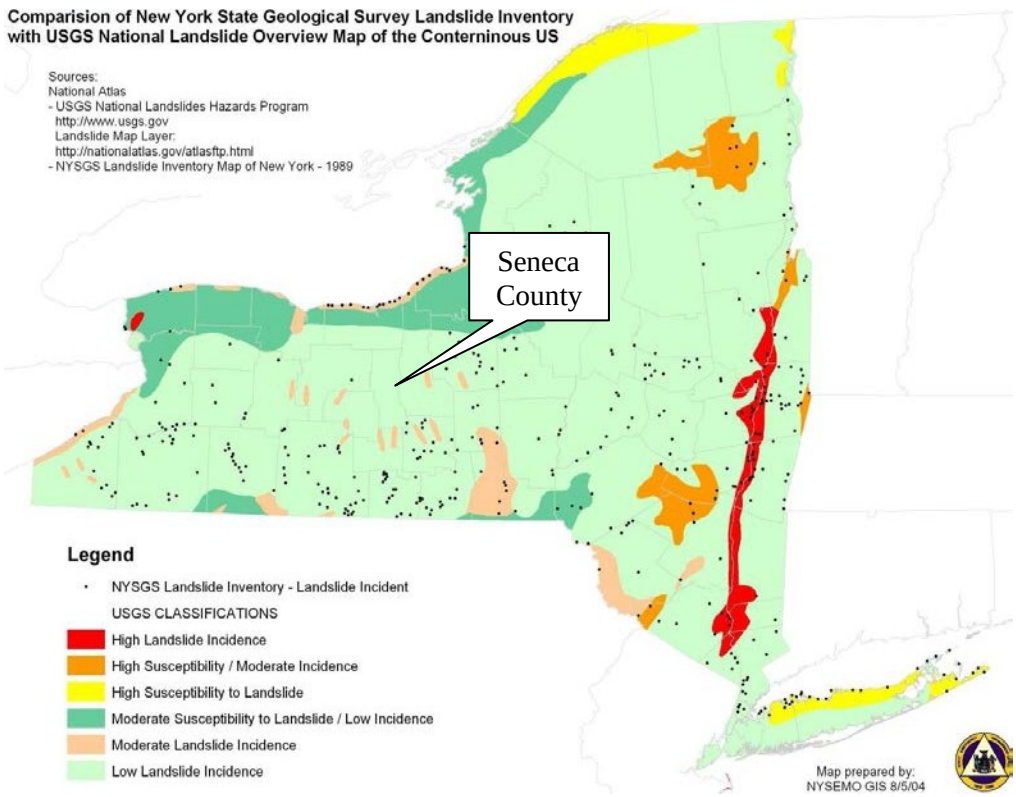
Hazard	**Ice Jam**
Impact Area	Countywide
History	2-3 minor events over 30 years (Local recollection of minor events, none recorded in USACE database)
Determining Factors	*Synopsis*: The terrain and predominantly rural features of Seneca County combine to minimize ice jam problems. Steep terrain in the south of the county exists only along the lakeshores, where mostly small streams carry water down to the lakes, more commonly causing erosion rather than ice jams. Flatter terrain in central and northern areas of the county will experience slow or poor drainage, spreading water over rural land, but flows are rarely restricted or do not have the velocity needed to create ice jams. In both areas, development densities are light, so if ice build-up occurs it is not a problem. *Events*: The U.S. Army Corps of Engineers Ice Jam Database does not record any historical ice jam events for Seneca County. There are local accounts of temporary and minor ice jams, but no serious damages or significant consequences are reported. *Determination*: Ice jams have not had significant consequences and any flooding associated with ice build-up may result in temporary closure of roads and minimal community disruption. In some cases, an ice jam may be a secondary concern that accompanies a more serious flood event, but overall flood impacts have always overshadowed ice jam issues. Local officials do not consider ice jams to be a 'Hazard of Concern'.



Source: NYS Hazard Mitigation Plan (2014) Note: Map data 1875-2007

Hazard	**Landslide**
Impact Area	Lakeside slopes in the Towns of Covert, Lodi. Ovid and Romulus
History	4-6 minor events in the past 20 years (Local recollection of minor events, 1 recorded in State inventory)
Determining Factors	*Synopsis:* Steep slopes along the shores of Seneca and Cayuga Lakes in the southern towns of Covert, Lodi, Ovid and Romulus can be subject to failure where sections of small streams and ravines that carry runoff down to the lakes give-way during heavy rains. The hills are wooded with dense foliage, so failures are limited to small locations, but they sometimes damage local roads and bridges. They can also carry alluvial (stone, soil, woody debris) material further downstream, causing associated blockages that need to be manually cleared-out. The impact and damage associated with landslides in Seneca County have been limited to specific or local sites in sparsely developed areas; usually private driveways, public roads, shoulders, bridges, improved drainage ways and culverts. *Events:* For Seneca County, the New York State Geological Survey Landslide Inventory lists one (1) historic landslide incident in the Town of Covert, with no reported impacts. While not considered a high profile disaster threat or vulnerability in the affected towns due to the isolated and limited nature of the landslides, Covert, Lodi and Romulus have included Hazard Mitigation projects in the Goals section of this plan for areas where recent landslides have damaged local roads, bridges and culverts. *Determination:* In the steeper lakeside perimeters of southern Seneca County where the greatest risk for landslides exists, there is only sparse and scattered development and a slide would not have significant impacts. Most landslides result in damage to a roadway and drainage at a single or isolated location and do not threaten large portions of the community. The Seneca County Soil and Water Conservation District cautions, however, against clear cutting on steep slopes, which can dramatically increase landslide risks, especially if the grade is 15% or more.

In this community, clearcutting on a slope for highway development, then the building of homes contributed to landslide hazards



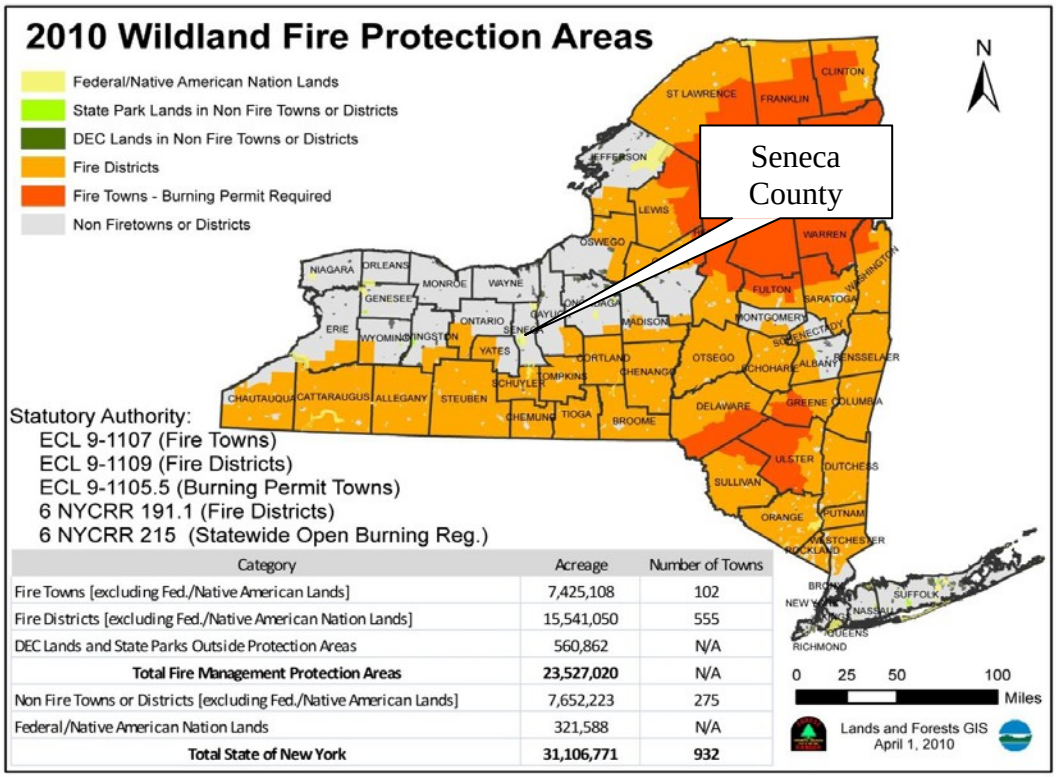
Source: NYS Hazard Mitigation Plan (2014)

Hazard	**Land Subsidence** (Sinkholes, Expansive Soils)
Impact Area	Unknown
History	None
Determining Factors	*Synopsis:* The sudden sinking or gradual downward settling of land with little or no horizontal motion, caused by a loss of subsurface support. *Events:* There are no recorded incidents or reports of land subsidence in Seneca County. *Determination:* Since there is no history of an occurrence, land subsidence is not considered a 'Hazard of Concern' for Seneca County. The NYS Hazard Mitigation Plan notes there have been natural land subsidence events in New York State, but it also indicates the risk to population and property is very low, and the virtually unpredictable nature of land subsidence makes reliable planning nearly impossible.

Hazard	**Tsunami**
Impact Area	None
History	None
Determining Factors	No coastal exposure.

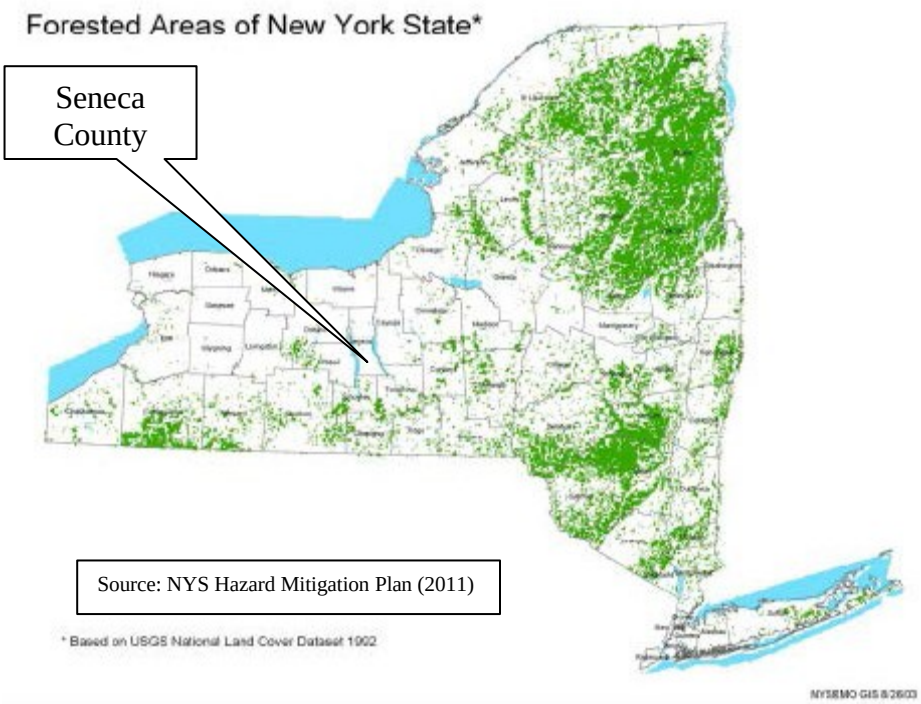
Hazard	**Volcano**
Impact Area	None
History	None
Determining Factors	There are no volcanos in or near Seneca County

Hazard	**Wildfire**
Impact Area	South Seneca County woodland areas, the Finger Lakes National Forest and the Montezuma National Wildlife Refuge
History	None
Determining Factors	*Synopsis:* Development patterns in rural Seneca County are such that a wildfire is not likely to impact a significant population or number of structures. The south of Seneca County has more densely wooded areas and includes a portion of the Finger Lakes National Forest, but the temperate weather and balanced moisture of the Finger Lakes climate prevent conditions that support wildfires. Marshland fires occur within the Montezuma National Wildlife Refuge in the north of Seneca County and brush fires are common during dry periods throughout the County, but they are contained or burn-out and do not pose the uncontrolled risks associated with wildfires. Wooded and forested areas are most prevalent in the County's southern towns of Covert, Lodi and Ovid, but there are no historical or reported incidents of wildfire. Much of the area is public land monitored by the NYS Department of Environmental Conservation, which manages the forest undergrowth to reduce fuel sources. The Montezuma Refuge in the north of the county is managed by the U.S. Fish and Wildlife Service where they monitor and apply land management practices to prevent fires. *Events:* There is no historical record or reports of wildfires in Seneca County. A news media report notes that a wildfire burned in the Montezuma Refuge in 2010, but this was actually a marshland fire contained within the Refuge that did not result in any off-site or community impacts and was allowed to burn-out naturally without firefighting intervention. *Determination:* The county recognizes a risk of wildfire in certain areas, but due to the forest profile, limited and well-managed development and protective actions in place, the overall risk and vulnerability are considered low.



Category	Acreage	Number of Towns
Fire Towns [excluding Fed./Native American Lands]	7,425,108	102
Fire Districts [excluding Fed./Native American Nation Lands]	15,541,050	555
DEC Lands and State Parks Outside Protection Areas	560,862	N/A
Total Fire Management Protection Areas	**23,527,020**	N/A
Non Fire Towns or Districts [excluding Fed./Native American Lands]	7,652,223	275
Federal/Native American Nation Lands	321,588	N/A
Total State of New York	**31,106,771**	**932**

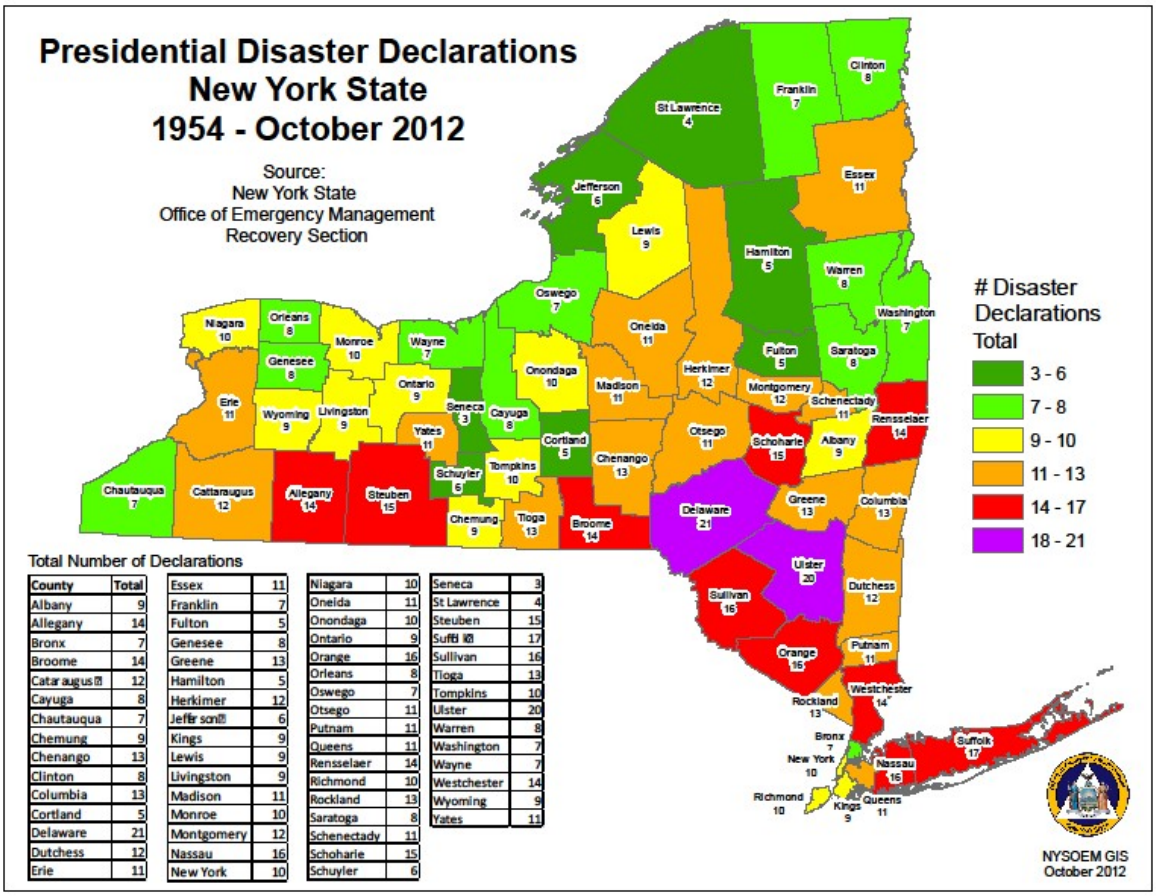
Source: NYS Hazard Mitigation Plan (2011)



Note: These maps from the 2011 State Hazard Mitigation Plan (SHMP) remain current and applicable even though they were not included or updated in the 2014 SHMP update

E. Major Disaster Declaration History

Since 1954, Seneca County has been declared a disaster area by the President and received federal assistance nine (9) times. Two were hurricanes that moved upstate as severe rains resulting in statewide declarations, and three (3) others were statewide power outages, health emergencies and the 9-11 disaster - none of which impacted Seneca County directly. Seneca County has received four (4) federal declarations for events that had direct and severe local impacts; two (2) major disasters and two (2) emergency declarations. A Major declaration provides multiple types of federal assistance, while an emergency declaration provides targeted and more limited help. While there have been four (4) Presidential disaster declarations for events with direct impacts on Seneca County, the following map offers a comparison of statewide declaration activity, even though it lists only three disasters for Seneca and omits the emergency declaration for the February 2003 snowstorm. There have not been any declarations for Seneca County since 2012.



Total Number of Declarations

County	Total
Albany	9
Allegany	14
Bronx	7
Broome	14
Cataraugus	12
Cayuga	8
Chautauqua	7
Chemung	9
Chenango	13
Clinton	8
Columbia	13
Cortland	5
Delaware	21
Dutchess	12
Erie	11

Essex	11
Franklin	7
Fulton	5
Genesee	8
Greene	13
Hamilton	5
Herkimer	12
Jefferson	6
Kings	9
Lewis	9
Livingston	9
Madison	11
Monroe	10
Montgomery	12
Nassau	16
New York	10

Niagara	10
Oneida	11
Onondaga	10
Ontario	9
Orange	16
Orleans	8
Oswego	7
Otsego	11
Putnam	11
Queens	11
Rensselaer	14
Richmond	10
Rockland	13
Saratoga	8
Schenectady	11
Schoharie	15
Schuyler	6

Seneca	3
St Lawrence	4
Steuben	15
Suffolk	17
Sullivan	16
Tioga	13
Tompkins	10
Ulster	20
Warren	8
Washington	7
Wayne	7
Westchester	14
Wyoming	9
Yates	11

Federal Disaster Declarations with Local Impacts for Seneca County (4)

Year	Hazard	Type
2003	Snowstorm	Emergency Declaration
2003	Statewide Power Outage	Emergency Declaration
2003	Ice Storm	Major Disaster
1972	Flooding Tropical Storm Agnes	Major Disaster

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Hazard Profile – Earthquake 38

Section IV Hazard Profiles

Seneca County Hazard Profiles

A hazard profile follows for each of the six (6) natural hazards identified in Section III that were designated as 'Hazards of Concern'.

Profiled Hazards of Concern	
Severe Storm	Winter Storm
Tornado	Earthquake
Ice Storm	Flood

The risk assessment determined that these hazards pose a significant risk, or a serious occurrence could have major impacts for Seneca County. The unique characteristics of each community have a significant influence on the severity or impacts of a particular hazard and how it will affect the area. For example, because Seneca County is not densely populated and has abundant open space with modest development, hazards such as transportation accidents or winter storms have a largely different profile and impact than they would in an urban setting. In addition, hazards produce different kinds of effects as they vary in duration and intensity. For example, tornados in Seneca County have been rare and had minimal impact, but Seneca County could just as likely experience the kind of devastating tornados that have affected other New York communities. Geography, demographics, development, environmental, economic and other factors all impact how a hazard will affect Seneca County. The hazard profiles examine these features to determine in what ways, and to what extent the hazard can impact Seneca County.

Seneca County's Hazard Mitigation Plan is prepared using climate change guidance and information provided by the National Weather Service, NYS Department of Environmental Conservation and NYS Office of Emergency Management. Evaluating the influence climate change will have on both the hazards impacting Seneca County and the local prevention strategies that are proposed will insure that projects are adapted to reflect changing climate conditions.

The latest data and maps have been used for topics that follow in this section, although some date back to 2007. In each case information remains applicable and through 2018 there has been no change in circumstances that would alter the analysis for Seneca County.

Hazard Profiles - Data Collection Sources

National Climatic Data Center (NCDC)

National Weather Service (NWS) – Buffalo and Binghamton

NYS Department of Environmental Conservation

NYS Department of Homeland Security and Emergency Services (DHSES)

Federal Emergency Management Agency (FEMA)

U.S. Army Corps of Engineers

U.S. Department of Agriculture

Seneca County Soil and Water Conservation District (SWCD)

NYS Canal Corporation

Accounts and references provided by Seneca County and local officials

An example of drainage improvements to prevent flooding - funded by the FEMA mitigation programs
photo: fema.gov

A *previous hazard event* is a documented occurrence of storms, significant weather or a natural hazard that has sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce.

Hazard Profile – Flood

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Flood *Definition:* When water bodies, channels and natural drainage pathways overflow their capacities and cause significant damage and disruption. *Impact Area:* Countywide	10 Flood events since 1993 1993 1996 – 3 events 1999 2000 2003 2004 2005 2014 Seneca County was also flooded by Tropical Storm Agnes in 1972	Death and Injuries Property and structural damage Damage to roads, utilities, bridges, infrastructure Evacuations of residents and stranded victims Water rescue and other high risk response Breakdown of emergency communications Disruption of transportation Delayed access for emergency services Alteration of natural drainage patterns Damage to designed drainage systems Damage to flood protection systems Shelter, feeding and temporary housing Economic impacts, property value and tax losses Employment and business disruption and losses Damage to natural features and habitat Increased health risks Contamination and disease Water supply contamination Secondary hazardous materials exposure Threat to dams and secondary flooding Power outages Increased demand for health/medical services Increased need for human and social services Disruption of home medical and care services Disrupted access for pharmacy and health needs Crisis counseling and mental health services Institutional threats; prisons, nursing homes, etc.	1993 – 2016 23 years Average is 1 flood event every 2 to 3 years in Seneca County There is a 43% chance each year of having a flood with significant community impacts There is a 10% chance (1 in 10) that a flood will be of the severity required to result in federal disaster declaration As many as 3 separate flood events have occurred in a single year (1996) Flooding has occurred in 8 (35%) of the past 23 years. No flooding was recorded in 15 (65%) of the past 23 years

Annual precipitation is generally uniform throughout Seneca County, with slightly increased amounts in the central and extreme southern parts of the County. Average annual precipitation totals range from 32.3 to 33.7 inches.

Precipitation of one inch or more in 24 hours occurs an average of eight to ten days per year; although the probability of somewhat larger amounts is greater during the warm months. A storm producing 1.5 to 2 inches or more of precipitation in 24 hours can result in flooding. Storms with two inches or more precipitation average just one over several years -- and such intense storms are typically linked to a stationary or stalled thunderstorm that affects only a portion of the county.

W. Bayard St. Seneca Falls
photo: fingerlakesdailynews.com

HEP Plaza Flooding, Waterloo
photo: fingerlakes1.com

The National Climatic Data Center (NCDC) reports that ten (10) flood events have occurred in Seneca County from 1993 to 2016. Nine (9) of these floods had damage and losses that were significant in scope, resulting in the organization of damage assessments and a major community response. Only the 1996 flooding resulted in a federal disaster declaration. Four (4) of the flood events were influenced by late winter snowmelt in combination with heavy precipitation; Six (6) of the flood events were associated with severe thunderstorms.

Location	Year	Date	Property Damage (Est.)
Countywide	1993	April/May	N/A*
Countywide	1996	January	$ 500,000
Waterloo	1996	April	$ 3,000
Countywide	1996	November	$100,000
Countywide	2000	July/August	N/A*
Ovid	2003	August	$ 100,000
North County	2004	July	$ 5,000
Countywide	2005	April	$ 50,000
Ovid	2014	May	$ 15,000
Seneca Falls	2014	August	$ 10,000
Fayette			$ 125,000

* Note: Where property damage estimates are N/A, local flooding occurred and was reported to NWS, but an assessment of the overall scope and costs of flooding was not performed or reported.

Disaster Declarations for Flooding

As noted in Section III, Seneca County has received three (3) federal disaster declarations; one, in 1972 was for flooding. A federal disaster declaration is requested by the Governor and only available when there are extraordinary disaster impacts and the ability to recover from the disaster exceeds the resources and capabilities of the state and local government. The NCDC records above note that ten (10) flood events resulting in significant property damage have occurred in Seneca County where no federal disaster assistance was made available. In most flood events, a community must be prepared to manage disaster recovery on their own, which underscores the importance of pre-disaster hazard mitigation measures and flood preparedness. For example, in the 1993 and 1996 floods, Seneca County reported that more than 250 homes were damaged in each incident, but neither event received federal disaster assistance.

Areas of Flood Risk

This is a general description of areas of greatest concern and at risk for flooding. This section provides a broad view of areas of the County most susceptible to flooding and is included to assist with hazard planning. This information addresses flood threats associated with recognized lakes, creeks, streams and waterways and does not include areas susceptible to landslide or steep slope failure during heavy rains.

Floodplain Maps and Requested Updates

This summary and the associated maps do not include all high-hazard flood zones and do not provide the kind of detail needed to determine if any particular site or property is at risk to flooding. Refer to FEMA Flood Insurance Rate Maps (FIRM) available online at fema.gov, or at local town/village offices, to determine if specific sites or properties are in a flood zone. The only floodplain updates that exist for Seneca County are Letters of Map Amendments (LOMA). Seneca County has requested floodplain map updating to revise existing maps produced in the 1980s, but no remapping is proposed and there are no digital floodplain maps for Seneca County.

Areas that have traditionally been most susceptible to flooding include the lakeshores of Cayuga and Seneca Lakes and along the Seneca River, which is also the channel of the State's Cayuga-Seneca Canal. Flooding is also common on local roads and drainageways in each of the towns and most villages. Drainage in central and eastern Seneca County is part of the Cayuga Lake Watershed and the west of the county is within the Seneca Lake Watershed. Both watersheds drain to the Seneca River, then the larger Oswego River Watershed to Lake Ontario. Northern parts of the county drain east and south to the Seneca River, or north to the Clyde River and then to the Seneca River.

Flooding in Seneca County occurs in the following ways. Weather and precipitation are dominant factors, but land use, the placement and density of structures, development, transportation systems, community infrastructure, agricultural practices and environmental management all influence flood severity.

1. *Cayuga and Seneca Lakes* - Flooding along the Cayuga and Seneca lakeshores due to high lake levels and flash flooding on the steep slopes of the lakes

2. *Seneca River* - Flooding along the Seneca River when flow exceeds channel capacity and/or barriers cannot contain excessive flows

3. *Marshlands* - Flooding when the swamps and marshlands in the north of Seneca County exceed capacity and impinge on roads and developed property

4. *Tributaries and Drainageways* - Flooding in all towns and villages where precipitation, snowmelt and runoff exceed the capacity of local streams, creeks, ditches, culverts and drainageways

Cayuga and Seneca Lakes

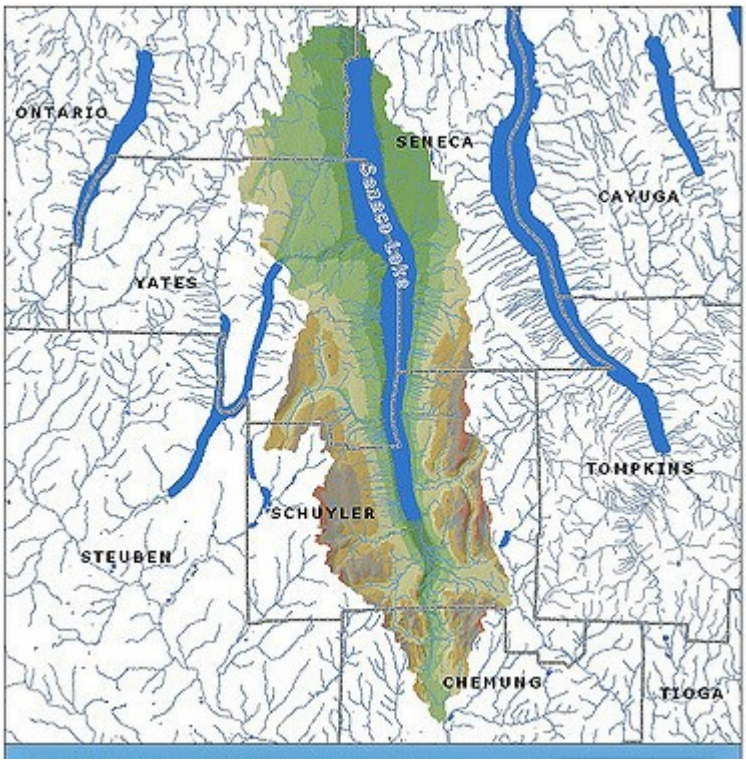
Flooding commonly occurs along the lakeshores of Cayuga and Seneca Lakes when lake levels rise. This can happen when there is an extended period of higher than normal precipitation, and is most acute in the early spring, especially if high lake levels combine with rains and snowmelt. Many of the structures on the lakeshores are older wood-frame seasonal residences, although the number of permanent residences and higher-end seasonal homes is increasing. Structural densities along the lakeshores are low, where cottages and homes are situated lengthwise along the shoreline, but there are pockets where 10 or 20 cottages form shoreline clusters. Flooding can impact shoreline properties even when other inland parts of the county are not affected, particularly in the spring when prolonged periods of precipitation and high lake levels are a persistent threat for days or weeks. The lakeshore flood hazard is usually an inundating type of flood where water slowly rises around and into the lower levels of structures; affecting foundations, floors, utilities, contents and landscape. In some cases, strong winds can drive water higher and exacerbate damages, but it is not the kind of violent flooding associated with flash floods and high-velocity riverine flooding.

In the southern zone along Cayuga Lake in the Towns of Covert and Romulus, and to a lesser extent on Seneca Lake in the Towns of Lodi and Ovid, there are steep slopes along the lakeshores that also pose a flash flood risk for property owners on the hillsides above the lakes, as well as those on the shoreline. When heavy rains and thunderstorms affect upland areas, there are many culverts, ditches and channels that carry runoff to the lakes; they can quickly be overwhelmed, sending torrents of powerful fast-moving water downhill that rips-apart anything in its path.

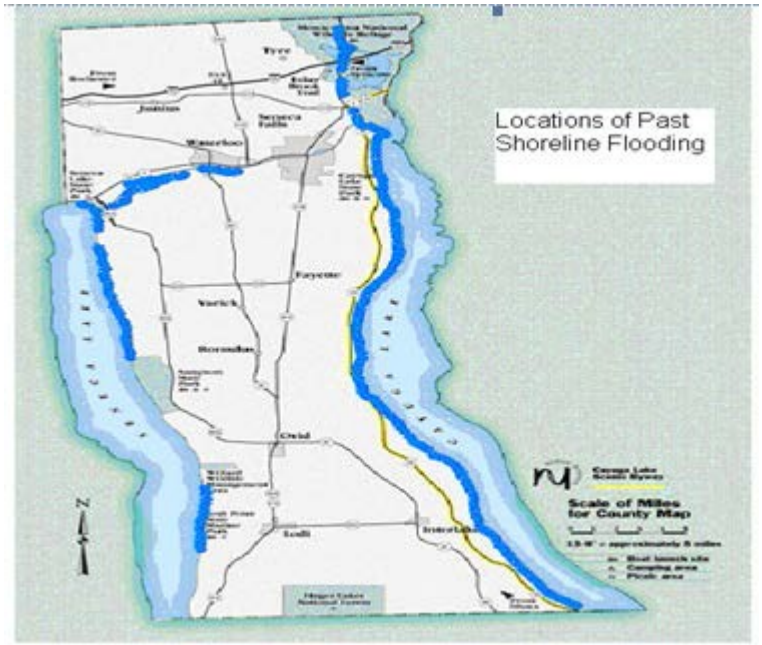
Public infrastructure -- particularly roads, bridges, water lines and drainage -- are also damaged by both types of floods; and many of these shoreline areas are serviced by single entry roads that can be damaged or blocked by floodwaters and debris, thus limiting access for emergency services.

The following map outlines the area and boundary of the Cayuga Lake Watershed which also spreads east and south to Cayuga, Schuyler and Tompkins Counties.

The Seneca Lake Watershed includes Ontario and Yates Counties to the east, Schuyler on the south and east and Chemung County to the south. Higher lakeside elevations to the south are shaded in grey and brown.



Seneca Lake Watershed
map by the Finger Lakes Institute

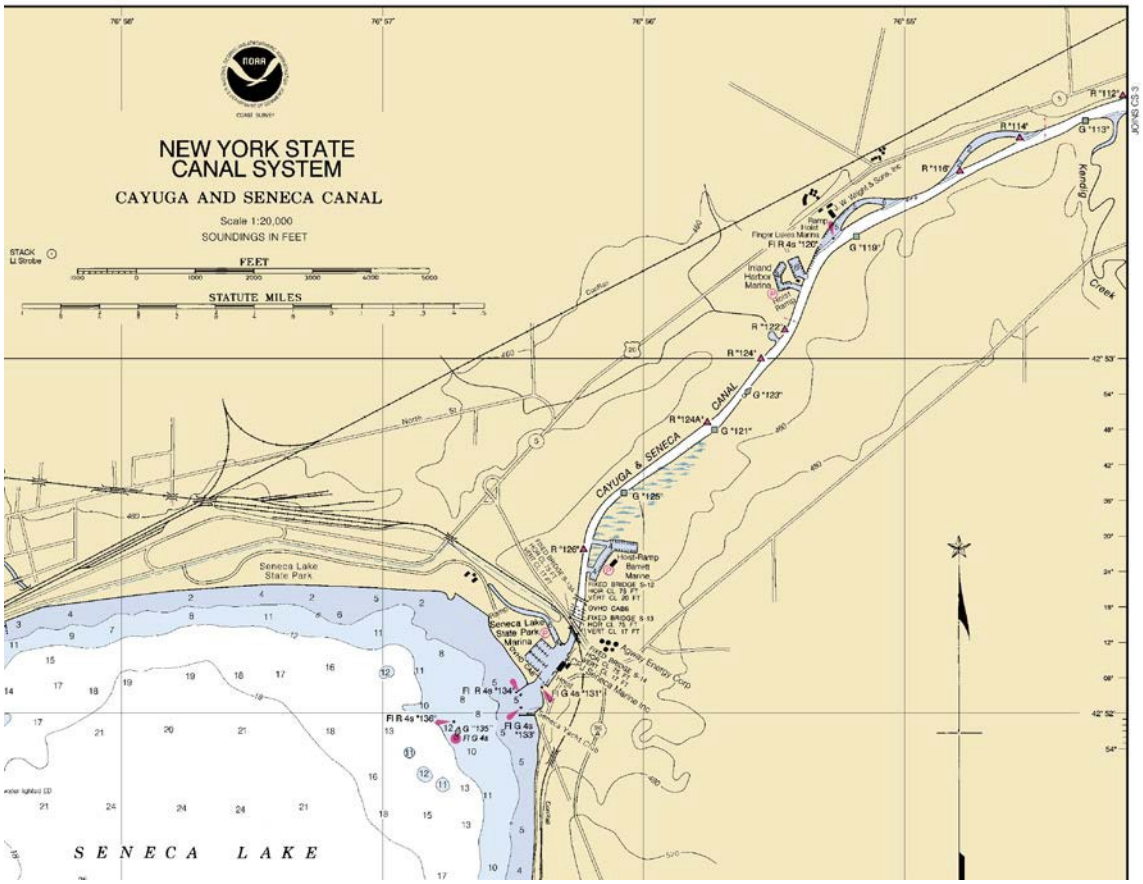


Lakeshore areas most susceptible to shoreline flooding

Seneca River

The portion of the Seneca River within Seneca County extends 20 miles from Seneca Lake east through the Villages of Waterloo and Seneca Falls, then meets the outlet of Cayuga Lake and turns north to the Clyde River and Erie Canal. Over its course in Seneca County, it also forms the State's Cayuga-Seneca Canal. Much of it was originally natural waterways or waterbodies, but considerable modifications have been made since it was first adapted for navigation in 1813.

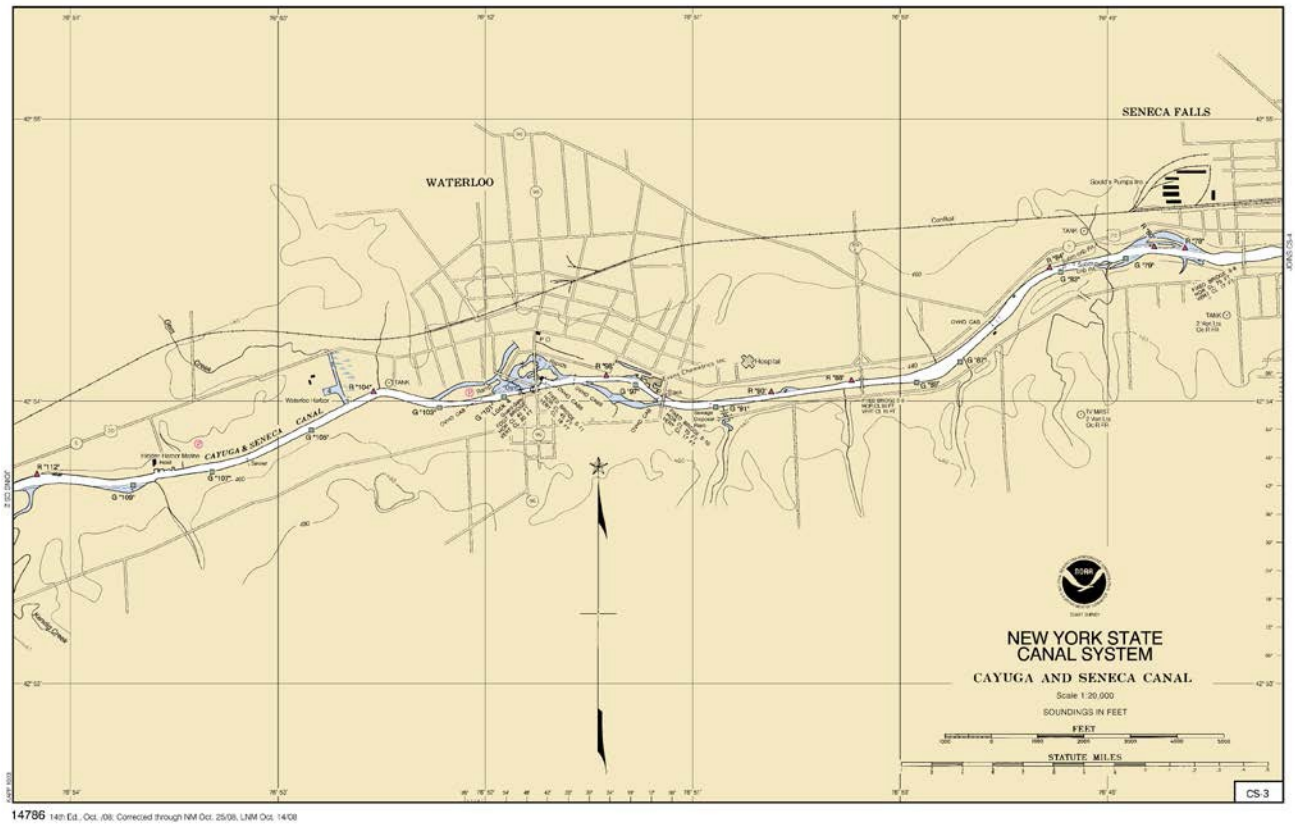
The elevation of the Seneca River over its length changes, but each section of the river is relatively flat because water levels are regulated by the canal locks. As a result, flood events are commonly an inundating or overflow type flooding where water rises and spreads, but lacks the overwhelming destructive power of other riverine floods. Still though, in periods of heavy rain and high river volumes, flows can still be forceful enough to damage roads, homes and other structures.



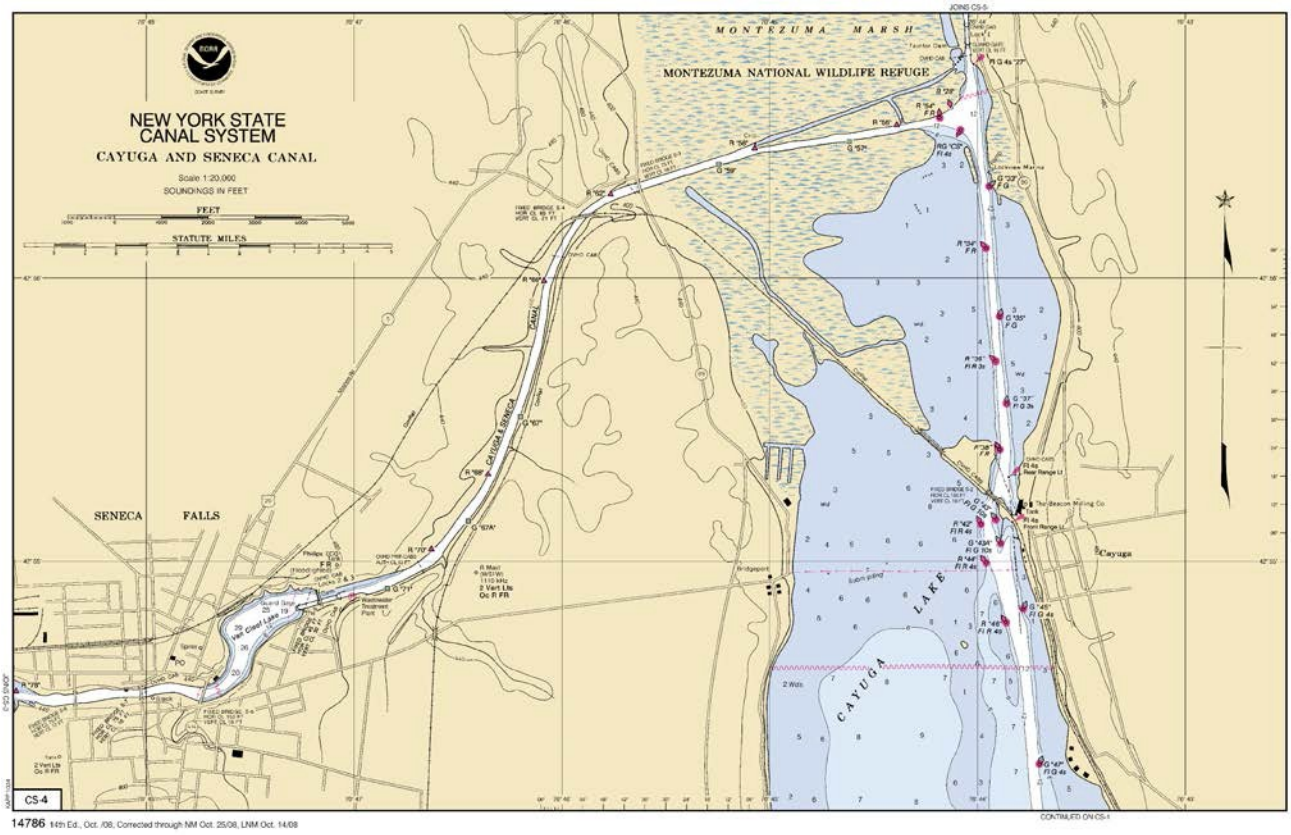
Seneca River 1 of 5 … The Seneca River from Seneca Lake east to Kendig Creek and Brewer Road (above) is characterized by marshland edges and estuaries, parkland, marinas, adjacent streets and highways, low density residential areas and highway commercial activity. The Town of Waterloo borders on the north and the Town of Fayette on the south.

Seneca River 2 of 5 … The Seneca River through the Villages of Waterloo and Seneca Falls (below) contains a dam used for hydroelectric production and navigation and a canal lock. The role and associated issues regarding the dams are outlined in Section III of this plan under the heading Dam Failure.

Along the river edges are medium density residential streets, the Main Street thoroughfares, village business districts, commercial plazas, marinas, parkland and industries. The Town and Village of Waterloo and the Town of Seneca Falls are on the northern border of the river, The Town of Fayette, Village of Waterloo and Town of Seneca Falls are on the south side of the river.

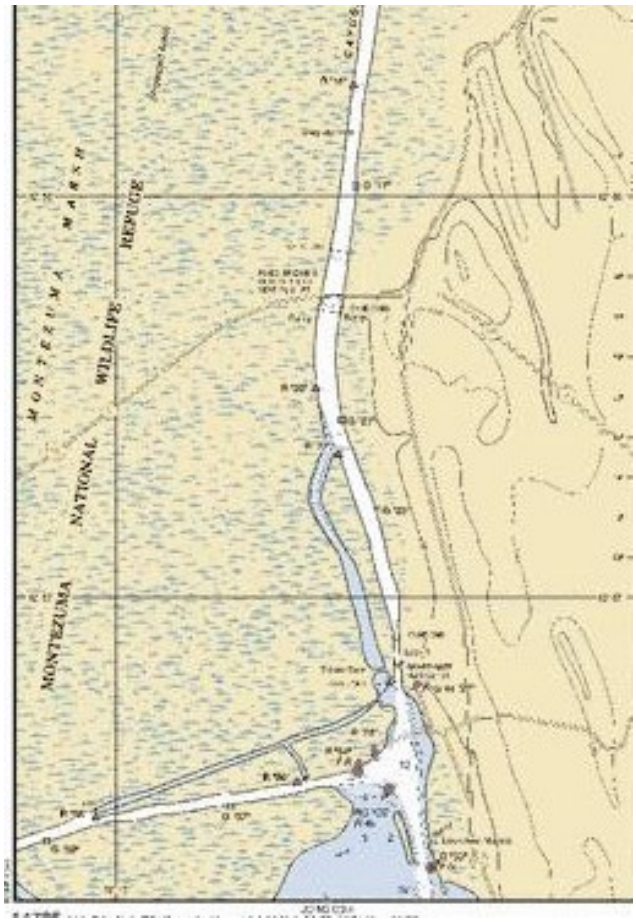


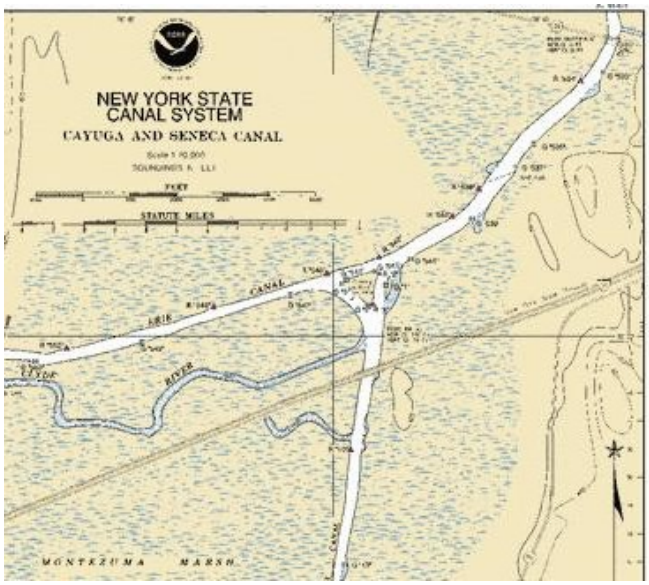
Seneca River 3 of 5 … The Seneca River from the Village of Seneca Falls east to the Cayuga Lake Outlet (below) contains a hydroelectric and navigation dam and two canal locks at Seneca Falls, and another flood control/navigation dam and canal lock (Mud Lock) at the Cayuga Outlet. Near Seneca Falls there are medium density residential and commercial areas, then toward the Cayuga Outlet residential use is sparse and there is open space, marshlands and environmental conservation zones. Residential areas near Seneca Falls are generally permanent, year-round, single family and apartment structures. To the east near Cayuga Lake, there are primary residences, but many are seasonal properties situated close to the river's edge. For a discussion about the Mud Lock Dam and associated flood threats see Section III of this plan under the heading Dam Failure.



Seneca River 4 of 5 and 5 of 5 … The Seneca River from Cayuga Lake north to the Clyde River and Erie Canal (next page) is sparsely populated marshlands that are predominantly part of the federal Montezuma National Wildlife Refuge. This part of the Seneca River forms the boundary between Seneca and Cayuga County on the east. The Towns of Seneca Falls borders the river to the south and the Town of Tyre is north.

Seneca River (4 of 5) north from Cayuga Lake. Town of Seneca Falls and Town of Tyre





Seneca River (5 of 5) in the north of Seneca County at the Clyde River and Erie Canal, Town of Tyre

Marshlands

The northeast part of Seneca County is situated in the expansive Montezuma Wetlands where drainage from Cayuga and Seneca Lakes, through the Seneca River, once formed 50,000 acres of marshlands, ponds and channels. Large tracts of the original wetlands have been adapted for agricultural use (some estimate as much as 70%) and are traversed by local roads and State highways, but significant portions remain natural and 10,000 acres of the wetland are designated as the Montezuma National Wildlife Refuge. The wetland area includes much of the Towns of Junius and Tyre and extends north into Wayne County and northeast to Cayuga County. The wetlands have historically been referred to as the 'Montezuma Swamp', but are primarily marshlands, since they are dominated by meadows and herbaceous plants such as water emerged grasses and reeds; where swamps are defined by woody plants like shrubs and trees. Marshes are often formed at the edges of lakes and streams where they form a transition between aquatic and terrestrial ecosystems.

The Montezuma Wetlands and Refuge

The wetlands retain enormous volumes of water where levels rise and fall substantially based on precipitation and climate factors. Flooding is mostly a problem when it impinges on roads and highways, causing road closures and limiting access, plus flooding results in damage to road shoulders, culverts and bridges where they restrict water during higher than normal flows. Agricultural croplands are affected when flooding occurs and residential properties can also be flooded. Damage to any home is always a serious matter for any individual property owner, but overall residential flooding is less in this area due to the low population density. For example, the 2010 population for the Town of Tyre is 981 people or 32.6 people per square mile.

Tributaries and Drainageways

Flooding in all of Seneca County's towns and most villages can occur when any of hundreds of tributaries, streams, creeks, ditches and drainageways are overwhelmed by precipitation and runoff. Problems are most acute in developed or higher density zones, but can occur anywhere when water flows exceed capacities, and are worsened when channels are blocked by debris or restricted due to outdated or inadequate design. In some cases, like the flooding of 1996, locations across the entire county can be affected and in other storms like those of 2014, only certain communities or sites were flooded. The locations where local officials have identified acute or repeated flood problems are those they have included in their Mitigation Strategies and Goals outlined in Section VI of this plan.

The following diagram provides a broad snapshot of well-known flood trouble spots in Seneca County.

Hazard Profile – Tornado

Hazard	Previous Events	Likely Impacts	Probability of Future Events
Tornado ***Definition:*** F1 or greater, confirmed by NWS ***Impact Area:*** Countywide Greater vulnerability for villages and populated areas	1950 – 2016 1 Tornado 2007 F1	Property damage Infrastructure, utility damage Deaths, injuries Power outages, electrical hazards Debris – flying, dense accumulation Transportation disruption Strain on medical services Disruption of services Temporary housing School and business closings Economic impacts Mental health/crisis counseling	There is a 10% chance each year that an **F4** tornado will occur somewhere in upstate New York Statewide: it can be expected that 1 or 2 **F2** tornados will occur each year somewhere in the state Based on the history of tornados in Seneca County … There is a 1.5% chance each year of an **F1** or greater tornado in Seneca County

Tornado – Fujita Scale

Enhanced Fujita Scale Source: NOAA National Climatic Data Center			
Scale	**Wind Speed**	**Description**	**Typical Damages**
F0	40-72 mph	- Gale - Light Damage	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; signboards damaged.
F1	73-112 mph	- Weak - Moderate Damage	Peels surface off roofs, mobile homes pushed off foundations or overturned, moving autos blown off roads.
F2	113-157 mph	- Strong - Considerable Damage	Peels surface off roofs; mobile homes pushed off foundations or overturned, moving autos blown off roads.
F3	158-206 mph	Severe Damage	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260 mph	Devastating Damage	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible Damage	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Seneca County Tornado History

1 Tornado was reported in Seneca County, New York between 01/01/1950 and 7/31/2016
Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD Property Damage

Location	Date	Type	Mag	Dth	Inj	PrD
Sheldrake Seneca County	06/21/2007	Tornado	EF-1	0	0	10.00K

NWS / Spotter Reports

After monitoring the storm on radar and receiving local spotter reports, the National Weather Service storm survey team visited Sheldrake and the Town of Ovid, determining that the orientation of the tree damage and the cyclonic rotation pattern of the storm aftermath confirmed that a tornado occurred. The swath of wind damage produced by the tornado exhibited the characteristics of an EF-1 tornado on the Enhanced Fujita Scale. The damage consisted mainly of snapped off and uprooted trees, indicating that maximum wind speeds were around 90 mph. The tornado touched down at 3:46pm in Sheldrake, near the north end of Wyers Point Road, just east of State Route 89 and near the western shore of Cayuga Lake. The tornado then tracked southeast for about 1.5 miles, parallel to Wyers Point Road and the Cayuga Lake shoreline. The observed damage had a width up to 100 yards and numerous trees sustained damage along this course. Utility poles in this vicinity were either knocked down or sheared off. Eyewitness accounts also described violently rotating debris above ground level and visual sightings of a storm funnel that reached the ground. Structural damage was relatively minor; a metal road sign was uprooted and blown across County Route 139, and a garage just off Wyers Point Road sustained roof damage from fallen trees. The tornado eventually crossed County Route 139 and lifted over the waters of Cayuga Lake.

Tornado Risk Factors

The fact that only one (1) minor tornado has been recorded in Seneca County might inaccurately lead some to think there is little risk of dangerous tornados in the area. Actually, the risk and probability of tornados is very real in Seneca County due to the history of tornados in neighboring counties and throughout upstate New York. Seneca County shares similar geographic and climate conditions to these other counties where tornados have occurred, which means that Seneca must evaluate its tornado risk based on regional or statewide factors, not just local experience.

The following table outlines recent tornados that have occurred in nearby areas. Many of these tornados resulted in relatively minor damage, particularly when they occur in rural and sparsely populated areas, but even an F1 tornado can result in overwhelming injuries and damage if it strikes a village or developed and populated area.

Date	County	Location	Intensity
July 2014	Schuler County	Reading and Watkins Glen	F1
August 2011	Cayuga and Wayne Counties	Spring Lake and Savannah	F2
June 1996	Yates	Middlesex	F1
August 1994	Ontario	Near Geneva	F1
April 1991	Cayuga County	Sennett	F1
August 1990	Schuyler County	Hector	F2
May 1983	Cayuga and Onondaga Counties	Near Cato	F3

Tornados are usually associated with severe thunderstorms and forecasters can often determine that storm conditions are favorable for the development of tornados. In these instances, NWS will issue a tornado 'watch' when it is possible that a storm could produce a tornado. In recent years, NWS has issued the following tornado watches and warnings for Seneca County, although no tornado resulted from these storms.

June 12, 2015 - Tornado Warning, South Seneca County
May 21 2013 Tornado Warning, Central Seneca County
October 13, 2013 Tornado Watch, Central New York and Finger Lakes, including Seneca County

On May 30, 2012, residents in the Town of Fayette reported that a tornado occurred when a violent storm with 80 mph winds caused widespread damage. A State of Emergency was declared by Seneca County and upon inspection by the NWS, it was determined to be a severe straight-line downburst or microburst storm, but did not meet the criteria to be classified a tornado.

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Across New York State there is an average of 7 tornados each year and every county in the State has recorded a tornado. In recent years the most damaging tornado (F3) struck Mechanicville in Saratoga County in 1998, resulting in 68 injuries and $60 million in damage. In 1989, a series of F4 tornados affected Albany, Columbia, Greene, Montgomery and Schoharie counties, and there was an F4 tornado in Chautauqua County.

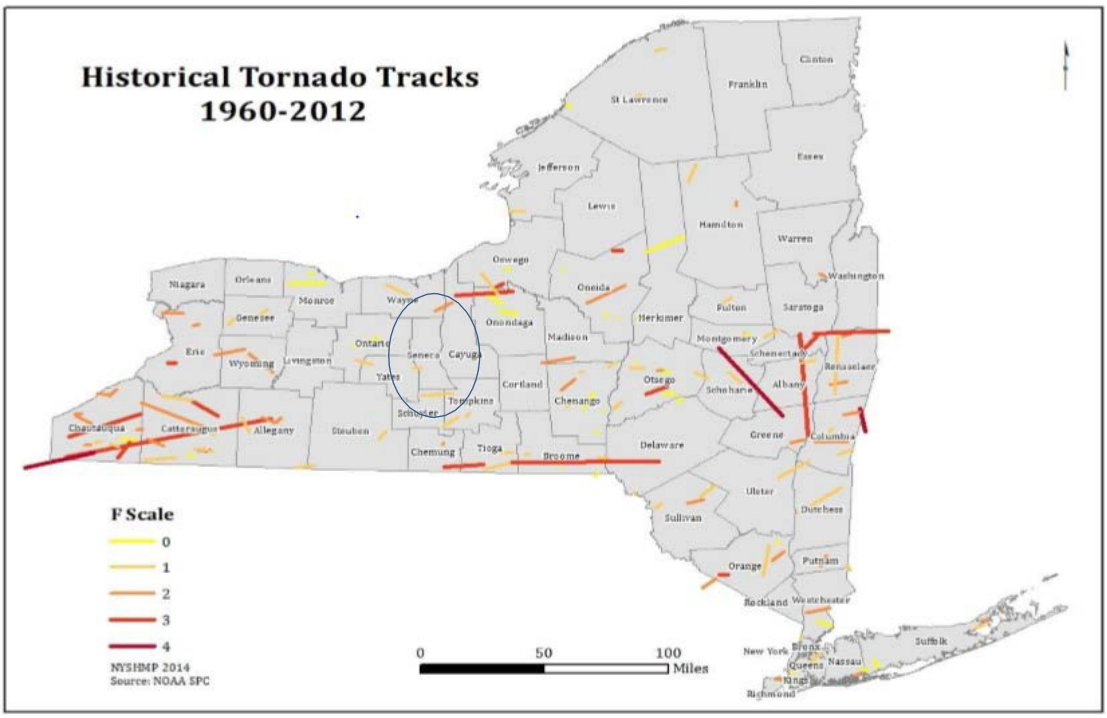
F2 and Greater Tornados in New York State

Tornados in New York State – F2 and Greater – 1950 thru 2016		
Scale	Number	Location
F2	89	Statewide
F3	25	Statewide
F4	6	Albany, Columbia, Chautauqua, Greene, Montgomery, Schoharie
F5	0	None to date

Source: NOAA National Climatic Data Center

Tornados are the most violent storms on earth and wind speeds can exceed 200 mph. Tornados are usually associated with thunderstorms and even when forecasters can determine that condition exist for the development of a tornado, they might only provide a few minutes warning. Contrary to most beliefs, hills and mountains offer no protection from tornados.

Early warning capabilities and moving people to well-designed shelters are important for tornado preparedness, and improved structural standards and building practices are essential for effective tornado resistance. The NYS Building Code requires that structures be built to withstand 90 mph winds, and beginning in 2003, structures that pose a higher hazard to human life were required to meet a more stringent standard.


Historical Tornado Tracks
1960-2012
F Scale
0
1
2
3
4
NYSHMP 2014
Source: NOAA SPC
0
50
100
Miles
Clinton
Franklin
St Lawrence
Essex
Jefferson
Lewis
Hamilton
Warren
Oswego
Washington
Niagara
Orleans
Monroe
Wayne
Oneida
Fulton
Saratoga
Genesee
Onondaga
Herkimer
Madison
Montgomery
Erie
Wyoming
Livingston
Ontario
Seneca
Cayuga
Schenectady
Rensselaer
Yates
Cortland
Otsego
Schoharie
Albany
Tompkins
Chenango
Schuyler
Chautauqua
Cattaraugus
Allegany
Steuben
Greene
Columbia
Chemung
Tioga
Broome
Delaware
Ulster
Sullivan
Dutchess
Orange
Putnam
Rockland
Westchester
Suffolk
New York
Bronx
Queens
Nassau
Kings
Richmond

Hazard Profile - Severe Winter Storm

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Severe Winter Storm *Definition:* Severe and/or sustained hazardous winter weather that poses a threat to life and/or property; including any, or a combination of the following: heavy snow, blowing snow, blizzard, freezing rain, sleet, and strong winds. *Impact Area:* Countywide	18 events from 1999 to 2016 Mostly travel hazards, road closures and power outages One, in 2003 was declared a federal disaster	Transportation and road disruption/closings School, business and government disruption/closings Increased traffic accidents, including injuries and deaths Health and medical injuries, emergencies and deaths Disruptions/delays in fire, medical, and safety services Delays/disruption in scheduled medical services Difficulties and disruption with pharmaceutical Supplies Roof and structural damage, collapse Stranded motorists, citizens, travelers Power outages and heating disruptions Need for shelters, warming centers, food and transportation Food, lodging and services for critical workers Downed/suspended/unsafe trees, limbs and wires Abandoned vehicles Public access hazards for schools, medical facilities, etc. Generator and power support issues Carbon monoxide hazards Extended snow and ice maintenance, operations and materials	1999 – 2016 17 Years Average is about 1 severe winter storm each year In 4 of 17 years, there was more than one winter storm In 7 of 17 years there were no winter storms Each year, the probability of a winter storm is 59% The chance that more than one winter storm will occur in any year is 23.5%

Weather Channel forecast map for the December 2008 Snowstorm

Winter Storm History

From 1999 to 2016, the National Weather Service has recorded eighteen (18) severe winter storm events in Seneca County. Five of the eighteen resulted in 12 inches or more of snow, two had near blizzard conditions, two produced scattered power outages, several were combined with high winds, sleet and freezing rain – and one was declared a federal disaster. All of these storms resulted in hazardous travel, some caused road and school closures, there were additional expenses associated with snow removal and debris cleanup -- but there were no injuries or property damage reported.

Seneca County receives about the same average snowfall amounts as seen elsewhere across the Finger Lakes and Central New York. The County is not within the heavy lake-effect 'snowbelt' regions directly east of Lakes Erie and Ontario, so annual snowfalls are not as high as Buffalo or Syracuse. There is no significant difference is average snowfall amounts from north to south in Seneca County. Storms affecting Seneca County can originate as a 'nor-easter' that tracks up and through the northeast from the Atlantic coast, a 'lake effect' storm where winds drive snow from the north off Lake Ontario and storm systems that move across the county from the west.

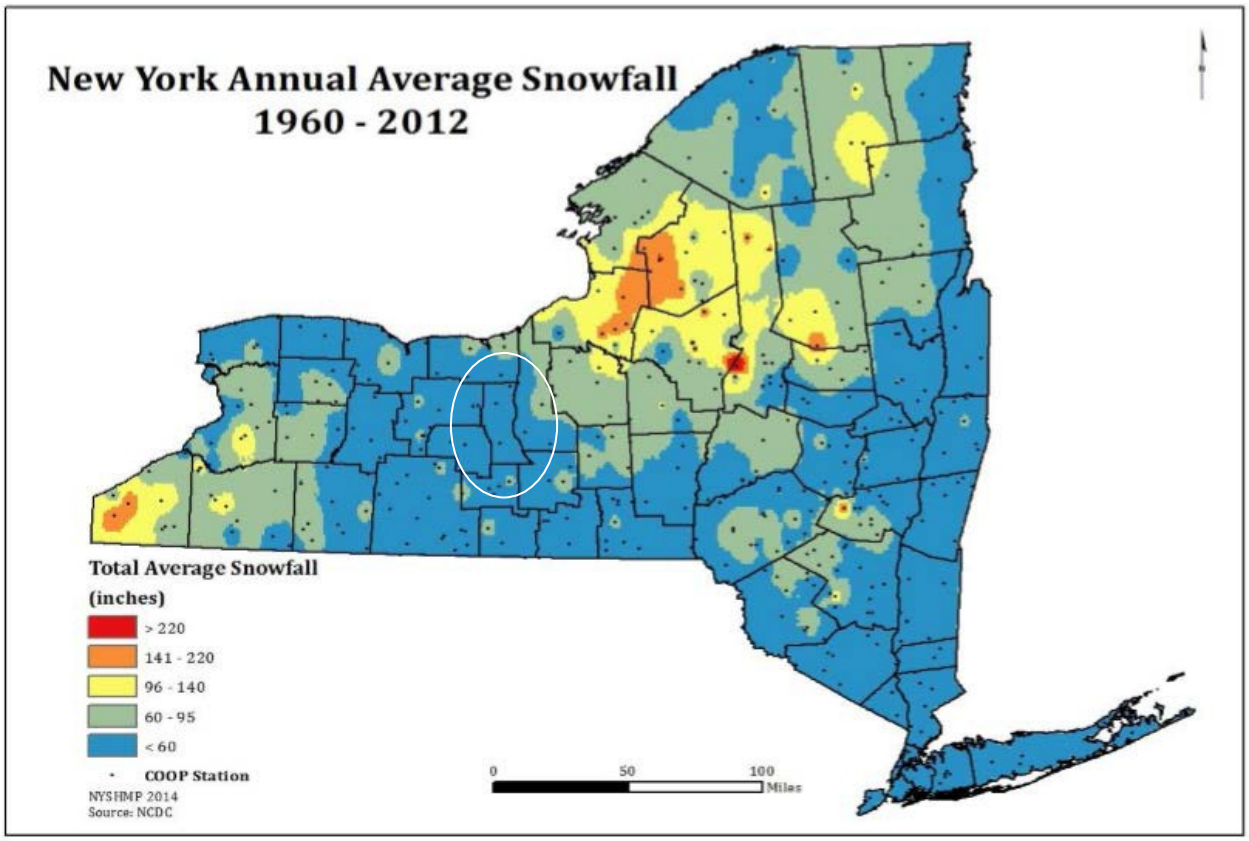
18 Winter Storm event(s) were reported in Seneca County between January 1999 and July 2016

Source: NOAA National Climatic Data Center

Date	Type	Area	Snow Amount	Hazards
January 8, 1999	Snowstorm / Ice	Countywide	7-8 inches	Travel
January 13, 1999	Snow, Sleet, Freezing Rain	Countywide	6-12 inches	Travel Power Outages
March 31, 2002	Snow and Freezing Rain	Countywide	Mostly Freezing Rain and Ice	Travel
February 16, 2003	Snow (Federal Disaster)*	Countywide	5-10 inches	Travel
February 13, 2007	Snow, Sleet, Wind	Countywide	8-12 inches	Near Blizzard Conditions
April 4, 2007	Rain Changed to Snow	Countywide	Up to 12 inches	Travel
December 15, 2007	Snow, Sleet, Freezing Rain	Countywide	Up to 12 inches	Travel
February 26, 2008	Snowstorm	Countywide	5-10 inches	Travel
December 19, 2008	Snowstorm	Countywide	5-11 inches	Travel
December 31, 2008	Snowstorm	Countywide	5-8 inches	Travel
January 27, 2009	Snowstorm	Countywide	6-8 inches	Travel

Date	Type	Area	Snow Amount	Hazards
February 25, 2010	Snow and Wind	Countywide	10-15 inches	Near Blizzard Conditions
February 25, 2011	Snowstorm	Countywide	6-10 inches	Travel
December 26, 2012	Snowstorm	Countywide	6-8 inches	Travel
January 2, 2014	Snow and Wind	Countywide	9-10 inches	Travel Power Outages
February 5, 2014	Snowstorm	Countywide	8-10 inches	Travel
March 12, 2014	Snowstorm	Countywide	7 inches	Travel
December 10, 2014	Snowstorm	Countywide	9-14 inches	Travel

* Seneca County was included in the Presidential Disaster Declaration for the *President's Day Storm* of February, 2003. This storm seriously impacted areas of eastern New York and the northeast United States. In Seneca County, where there was 5-10 inches of snow, the storm was not extraordinarily severe compared to other listed winter storm events, but Seneca County met the declaration criteria and was eligible to receive federal disaster assistance for this storm.



Winter Storm Risk Summary

Winter storms in Seneca County have not historically resulted in deaths, injuries or extensive property damage; particularly when compared with other high-profile natural hazards that occur in New York and nationally, such as floods and tornados. Severe winter storms are still considered a '*Hazard of Concern*', however, because they can be dangerous, costly and disruptive. Severe winter storms almost always result in hazardous travel and usually interrupt vital community activities when schools and workplaces are closed, public services are interrupted and commerce is suspended. Winter storms are a particular burden for local governments due to the extraordinary costs associated with snow removal, cleanup and emergency services. The community at-large is impacted because travel, public services and businesses are disrupted; plus it can be more difficult to access vital medical services and there is a greater risk of fires when alternate heating sources are used.

A special winter hazard concern for Seneca County is the NYS Thruway (Interstate 90) that traverses east/west through Seneca County in the northern Towns of Junius and Tyre. This can be a secondary hazard during a winter storm when interstate travel is diverted and travelers are forced off the Thruway seeking shelter and services. It primarily impacts the Town of Tyre where travel exits the Thruway and there are limited services, but Seneca Falls and Waterloo are also impacted when motorists seek services and traffic is detoured onto local roads.

Snow removal in the December, 2014 storm
fingerlakesdailynews.com

Winter storm travel hazards
fingerlakesdailynews.com

The 2014 NYS Hazard Mitigation Plan rated local snow storm vulnerability using average snowfall data, the potential for extreme snowfall events, federally declared snow emergencies and population density. Vulnerability considers how a storm will impact a community, not just its probability of occurring. The rating assigned to each county ranged from 5 (least vulnerable) to 19 (greatest vulnerability). The rating was not solely based on the amount of snow, but also considered population density (where significant amounts of snow result in more problems) and the likelihood that an area would receive extreme amounts of snow.

The following counties in New York had the highest snow vulnerability ratings (14-19), because they are in the Snowbelt regions east of the Great Lakes and/or they have high-density populations where severe snowstorms pose greater hazards.

Jurisdiction Most Threatened by Snow and Vulnerable to Snow Loss

County	Rating Score (Max 25)	Annual Average Snowfall (inches)	*Extreme Snowfall Potential (no/yes)	# of Snow Related Disasters	Population Density (per square mile)	Total # of Structures (HAZUS)
Erie	19	116.1	yes	7	906.3	277470
Chautauqua	17	131.5	yes	5	128.5	45310
Albany	16	56.2	no	5	552.8	83117
Niagara	16	80.8	no	5	416.7	66394
Oswego	16	144.9	yes	3	120.7	40083
Oneida	16	132	yes	4	187.4	69590
Onondaga	15	107	yes	1	569.3	132013
Monroe	14	84.6	no	2	1108.7	210552
Cattaraugus	14	105.2	yes	4	63.4	29499
Dutchess	14	42.3	no	4	339.8	79721

Counties in New York State that have the least vulnerability to severe snowstorms had ratings from 5-7, and Seneca County was rated the least vulnerable (5) of all 62 counties in the State. This does not mean Seneca receives the least amount of snow – others receive less – but when the population density, geography and rural character of Seneca County are factored-in, a severe storm in Seneca County does not typically have the kind of overwhelming consequences that would be seen in an urban setting.

Jurisdiction Most Threatened by Snow and Vulnerable to Snow Loss

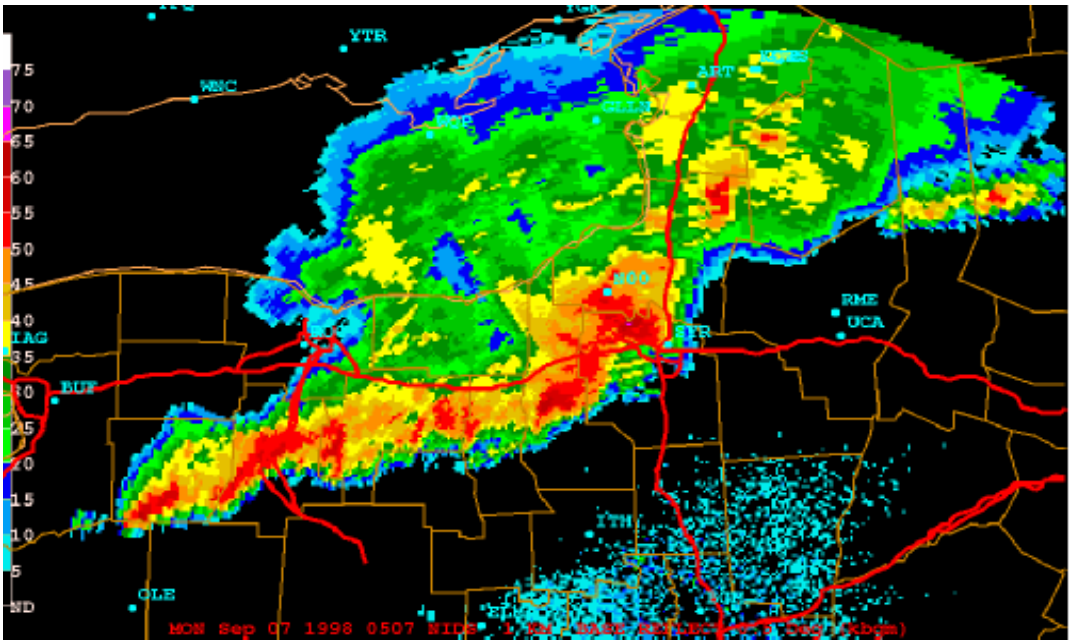
County	Rating Score (Max 25)	Annual Average Snowfall (inches)	*Extreme Snowfall Potential (no/yes)	# of Snow Related Disasters	Population Density (per square mile)	Total # of Structures (HAZUS)
Cortland	7	95	no	1	97	13599
Essex	7	87.7	no	1	21.2	17157
Hamilton	7	129.2	yes	1	3	6252
Schuyler	7	53.9	no	1	85.4	7378
Tioga	7	61.5	no	1	99.1	17232
Allegany	6	68.4	no	1	48.2	18096
Yates	6	56.5	no	1	65.5	9542
Seneca	5	58.7	no	1	40.6	11423

Even considering that a severe snowstorm is not likely to impact Seneca County to the extent other counties would be affected, snowstorms remain a '*Hazard of Concern*' for the County because of the dangers, costs, and disruption they pose. This highlights how serious snowstorms can be for all of New York State, where an area considered to least vulnerable remains at-risk to the hazards associated with severe snow.

Hazard Profile - Severe Storm (Thunderstorms, High Wind and Hail)

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Severe Storm *Definition:* A thunderstorm that can produce tornados, lightning and hail with winds of 58 mph or more *Impact Area:* Countywide	33 severe storm days* from 1980 to 2016 Property damage was reported in 22 of the 33 storm days* An injury was reported in one of the 33 storm events	Flash Flooding Drainage systems over-capacity Structural damage Downed trees, limbs, wires and utility poles Power outages Scattered, dense debris Deaths and injuries Electrical hazards Transportation and road disruption/closings Increased traffic accidents and injuries Medical emergencies, injuries and deaths Disruptions/delays in emergency response Food, lodging and services for critical workers Generator and power support issues Carbon monoxide exposure Chain saw injuries	1980-2016 36 Years Average for Seneca County is just less than one severe storm each year, or about 9 storms in a 10 year period Property damage will occur in two-thirds (2/3) of severe storms, or there is a 66% (2 in 3) chance of property damage with each storm An injury was reported in one of 33 storms, or there is a 3% chance of an injury in each storm

*A thunderstorm system can have multiple severe storm occurrences over several hours, so all storm episodes in an area within a single day are recorded as one event.



The 1998 Labor Day *Supercell* thunderstorm that produced a derecho crosses Seneca County

Source: NWS

Strong and violent winds in thunderstorms are referred to by several different names depending on the storm's features; including straight-line winds, downbursts, microbursts and derecho. Strong winds in thunderstorms often originate high in the atmosphere and are carried to the earth's surface in downdrafts of rain-cooled air. Thunderstorm winds, particularly those associated with downbursts and derechos can exceed 100 mph and can cause damage equal to a tornado.

Thunderstorm Wind and Damage Characteristics	
Straight-Line Winds	High velocity winds in a single direction across a wide area. High wind warnings are issued when winds reach 58 mph.
Downburst	Local currents of air that blast down from the top of a thunderstorm and shear or change direction near the ground, producing outward bursts of violent winds extending in all directions. The sharp downward and outward wind pattern differs from the linear path and circular pattern associated with tornados. Downburst winds can exceed 150 mph.
Microburst	A term used to describe the size of a downburst. Microbursts are downbursts where the damaging wind extends out to 2.5 miles from the downburst; a macro-burst extends more than 2.5 miles from the downburst.
Derecho	A derecho is a widespread, long-lived storm associated with a band of rapidly moving thunderstorms that produce strong straight-line winds. To be classified a derecho, a storm must have a wind damage swath that extends more than 240 miles and wind gusts of 58 mph or greater along most of its length.
Supercell Thunderstorm	Supercell thunderstorms are a special kind of highly organized single cell thunderstorm that can persist for many hours. Supercells are characterized by veering and turning updraft winds that produce storm-scale rotation that can reach more than 100 mph. They are responsible for nearly all of the significant tornadoes produced in the U.S. and for most of the hailstones larger than golf ball size. Supercells are known to produce extreme winds and flash flooding.
Tornado	A violent column of rotating air extending from a storm cloud that makes contact with the surface of the earth. Usually associated with severe thunderstorms, tornados are the most destructive of all atmospheric phenomena. Multiple tornados can form in a single storm; some might touch ground only briefly, while the most damaging can leave a destructive path for miles. Tornado winds can exceed 200 mph and the damage pattern affecting trees and debris on the ground will show a circular rotation.

Severe Thunderstorm History

The NOAA National Climatic Data Center reports there were 33 severe storm days (where storm winds exceeded 58 mph) in Seneca County from 1980 to 2016 (36 years). *A thunderstorm system can have multiple severe storm occurrences over several hours, so all storm episodes in an area within a single day are recorded as one event. Property damage was reported in 22 (about two-thirds) of these storms and there was an injury reported in 1 of 33 storms (3%).

33 Severe Storm event(s) were reported in Seneca County between 1/01/1980 and 7/31/2016
Source: NOAA National Climatic Data Center

Thunderstorm Date	Maximum Windspeed (In knots)*	Injuries	Property Damage $
10/25/1980	50	0	0
6/2/2000	52	0	0
7/14/2000	52	0	0
7/31/2000	52	0	0
7/1/2001	50	0	0
10/21/2001	52	0	0
3/9/2002	60	0	0
4/18/2004	70	0	200,000
8/29/2004	60	0	10,000
6/6/2005	50	0	5,000
6/10/2005	50	0	10,000
6/13/2005	50	0	10,000
7/26/2005	50	0	4,000
11/6/2005	50	0	2,000
6/8/2007	50	0	2,000
6/19/2007	50	0	0
6/21/2007	70	0	0
8/17/2007	50	0	1,000
10/9/2007	50	0	0
1/9/2008	50	0	1,000
6/10/2008	50	0	1,000
10/7/2009	50	0	2,000
7/21/2010	50	0	2,000
7/24/2010	50	0	1,000
5/29/2012	78	1	45,000
9/8/2012	60	0	20,000
5/21/2013	50	0	15,000

Thunderstorm Date	Maximum Windspeed (In knots)*	Injuries	Property Damage $
7/5/2013	50	0	5,000
6/16/2014	50	0	0
6/8/2015	60	0	8,000
6/10/2015	60	0	75,000
6/12/2015	50	0	5,000

* 50 knots = 58 mph (1 knot = 1.151 mph)

One of the more recent severe thunderstorms occurred June 10, 2015 where the most serious impacts were reported in the Towns of Romulus, Seneca Falls and Varick. Trees were uprooted and two homes were damaged with losses estimated at $45,000.

Based on property damage reports, the most severe thunderstorm in Seneca County over the past 36 years occurred April 18, 2004. The storm impacted the entire county and wind speeds reached 81 mph; $200,000 in damages were reported. Thunderstorm winds blew down trees, power poles and there were downed wires. The most severe impacts were on the east side of Seneca Lake and damage reports were most concentrated in the Town of Romulus where a radio tower was bent over a building.

The thunderstorm with the highest winds (90 mph), and the same storm in which an injury was reported, occurred on May 29, 2012. This storm likely resulted in a microburst because the tree damage was in a divergent or a fan shaped pattern. There was $45,000 in damage as the storm followed a course along Route 96A in Fayette, just east of Seneca Lake. In the area of Christler Road a barn was destroyed and a tractor trailer was blown off the road. Scattered damage was reported as the storm continued northeast through Seneca Falls and across Cayuga Lake.

Lower Lake Rd.
Seneca Falls
fingerlakesdailynews.com

W. Banyard St.
Seneca Falls
fingerlakesdailynews.com

Damaging High Winds

High wind damage is often associated with severe thunderstorms, but instances are common in Seneca County where high winds are generated in the absence of thunder and heavy rain. High winds can move cars and topple high-profile vehicles and will cause structural damage, uproot trees, bring down power poles and lines and produce power outages. The meteorological conditions that produce wind storms are similar to thunderstorms in that they are related to an approaching cold-front. A High Wind event is defined as those with sustained wind speeds of 40 mph or greater and lasting for one hour or longer, or winds of 58 mph or greater for any duration (National Weather Service, 2009).

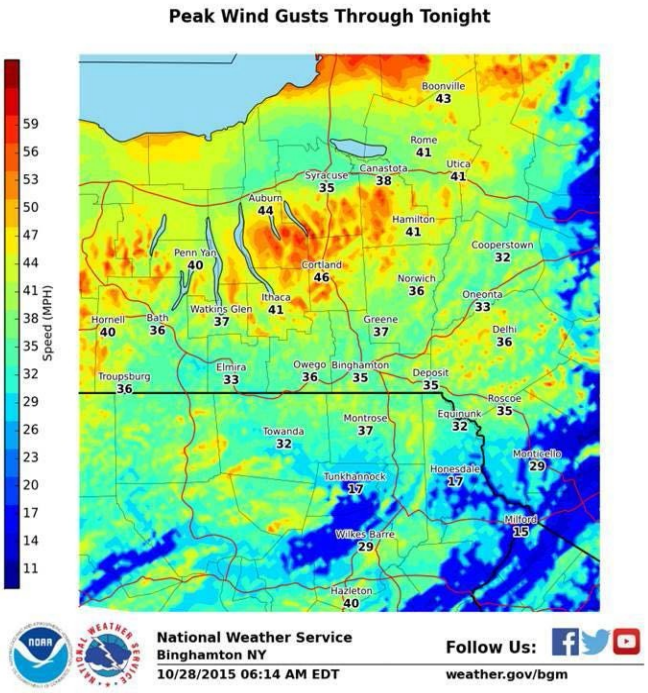
High wind storms occurred in about two-thirds (64%) of the 19 years represented in the database or the probability of a high wind storm each year is 64%. Interestingly, the database shows there were reported damages of $10,000 or greater in all but two of the 19 windstorm events. This represents a far great proportion of damages for windstorms than was noted above for thunderstorms. The stark difference may have to do with reporting methods; for example, wind data may include agricultural or utility estimates that were not in the thunderstorm summary, but closer examination of the data would be required to make a determination.

The National Climatic Data Center (NCDC) lists the following High Wind events for Seneca County in the period 1997-2016 (19 years).

Windstorm Date	Maximum Windspeed (knots)	Estimated Property Damage $
2/22/1997		20,000
11/10/1998		10,000
11/2/1999		33,330
12/12/2000	50	50,000
2/10/2001	52	20,000
9/19/2003	50	50,000
10/15/2003	60	50,000
11/13/2003	55	20,000
2/17/2006	50	0
10/29/2006	50	10,000
2/18/2011	50	40,000
1/31/2013	50	0

* 50 knots = 58 mph (1 knot = 1.151 mph)

!997-1999 windspeed not available



Peak Wind Gusts
October 28, 2015
NWS

Hail Damage

Hailstorms can be very damaging and along with severe wind and tornados, hail is one of the more serious hazards associated with thunderstorms. It is estimated that damage from hail approaches $1 billion in the U.S. annually. Agriculture and crop damage are typically the most serious concerns when hail occurs. People and animals can be injured by hailstones and hail frequently damages vehicles, residential and commercial roofs and landscapes.

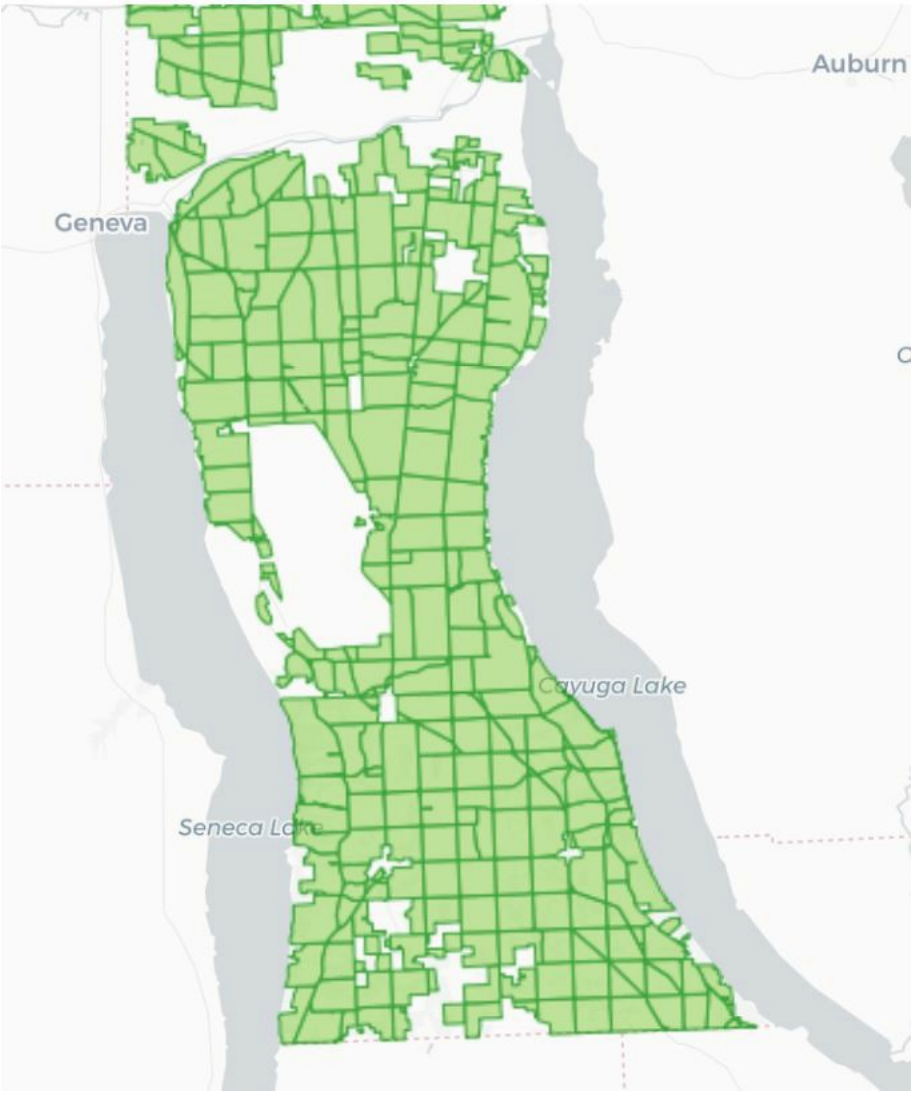
The National Climatic Data Center (NCDC) lists 26 Hail event days* for Seneca County in the period 1973-2016 (43 years). Three (3) of the 26 hailstorms reported property damage and are featured below. The 1994 storm primarily affected the Town of Tyre. Most of the damages reported in the 2007 storm were in Romulus and it had the largest size hail (1.75 inches). The 2013 hailstorm was in Waterloo and also had the largest diameter hail in the local record (1.75 inches).

Hailstorm Date	Hail Size (diameter in inches)	Estimated Property Damage $
7/25/1994	0.75	5,000
8/16/2007	1.75	10,000
5/21/2013	1.75	10,000

*A thunderstorm system can have multiple severe storm occurrences over several hours, so all hail storm episodes in an area within a single day are recorded as one event.

The map that follows shows the designation of Agricultural Districts in Seneca County where agriculture is the dominant land use. Hailstorms are particularly damaging to crops and agricultural activities and this vulnerability should be considered when planning mitigation actions.

Seneca County Agricultural Districts



Source: Cornell Institute for Resource Information Sciences (Cornell IRIS) 2010

Lightning

As one of the most dangerous hazards associated with thunderstorms, lightning is a universal and continuous threat to all communities – and one of the most successful mitigation strategies for any hazard is known to be public education about lightning safety.

According to analysis by the National Weather Service (NWS) in 2008, the United States averaged 51 annual lightning fatalities, placing lightning in the second position, just behind floods as the deadliest natural disaster. In any year, even when there are the most severe floods and tornados, lightning continues to be one of the top three storm-related killers in the United States.

Another NWS study examined data from 2006 through 2015, when 313 people were struck and killed by lightning in the United States. Almost two thirds of the deaths occurred to people who were enjoying outdoor leisure activities. During this 10-year period fishermen accounted for more than four times as many fatalities as golfers, while beach activities and camping each accounted for more than twice as many deaths as golf. From 2006 to 2015, there were a total of 33 fishing deaths, 18 beach deaths, 17 camping deaths, and 14 boating deaths. Of the sports activities, soccer saw the greatest number of deaths with 12, as compared to golf with 8. Around the home, yard work (including mowing the lawn) accounted for 13 fatalities. For work-related activities, farming topped the list with 16 deaths. June, July, and August are the peak months for lightning activity across the United States and the peak months for outdoor summer activities. As a result, more than 70% of the lightning deaths occurred in the months of June, July, and August, with Saturdays and Sundays having slightly more deaths than other days of the week.

Based on the media reports of the fatal incidents, many victims were either headed to safety at the time of the fatal strike or were just steps away from safety. Continued efforts are needed to convince people to get inside a safe place before lightning threatens. For many activities, situational awareness, proper planning and adherence to the following rules are essential to safety.*

- NO PLACE outside is safe when thunderstorms are in the area – not trees, not sheds!
- If you hear thunder, it means lightning is close enough to strike you.
- When you hear thunder, immediately move to safe shelter: a substantial building with electricity or plumbing or an enclosed, metal-topped vehicle with windows up.
- If you are too far to run to one of these options, you have no good alternative. Keep moving to safe shelter … You are NOT safe anywhere outdoors.
- Stay in safe shelter at least 30 minutes after you hear the last sound of thunder.

See: http://www.lightningsafety.noaa.gov/tips

Hazard Profile – Ice Storm

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Ice Storm *Definition:* A winter storm event where 0.25 inches of freezing rain accumulates on exposed surfaces *Impact Area:* Countywide	7 ice storms from 1999 to 2016 2 of the 7 ice storms had reported damages	Structural damage Downed trees, limbs, wires and utility poles Power outages Scattered, dense debris Deaths and injuries Electrical hazards Disrupted heating Shelters and food services for disaster victims Transportation and road disruption/closings Increased traffic accidents and injuries Health and medical injuries, emergencies and deaths Disruptions/delays in fire, medical, and safety services Food, lodging and services for critical workers Generator and power support issues Carbon monoxide exposure and chain saw injuries Hazards from hanging broken limbs and debris	1999 – 2016 17 Years An ice storm in Seneca County can be expected every 2 to 3 years. There is a 41% chance of an ice storm each year There is approximately a 12% chance each year of an ice storm that results in significant damages and costs

Seven (7) ice storms are included in the National Climatic Data Center records for Seneca County from 1999 to 2016. Although power and services were disrupted, overall damages and impacts for five of the seven storms were not reported to be significant.

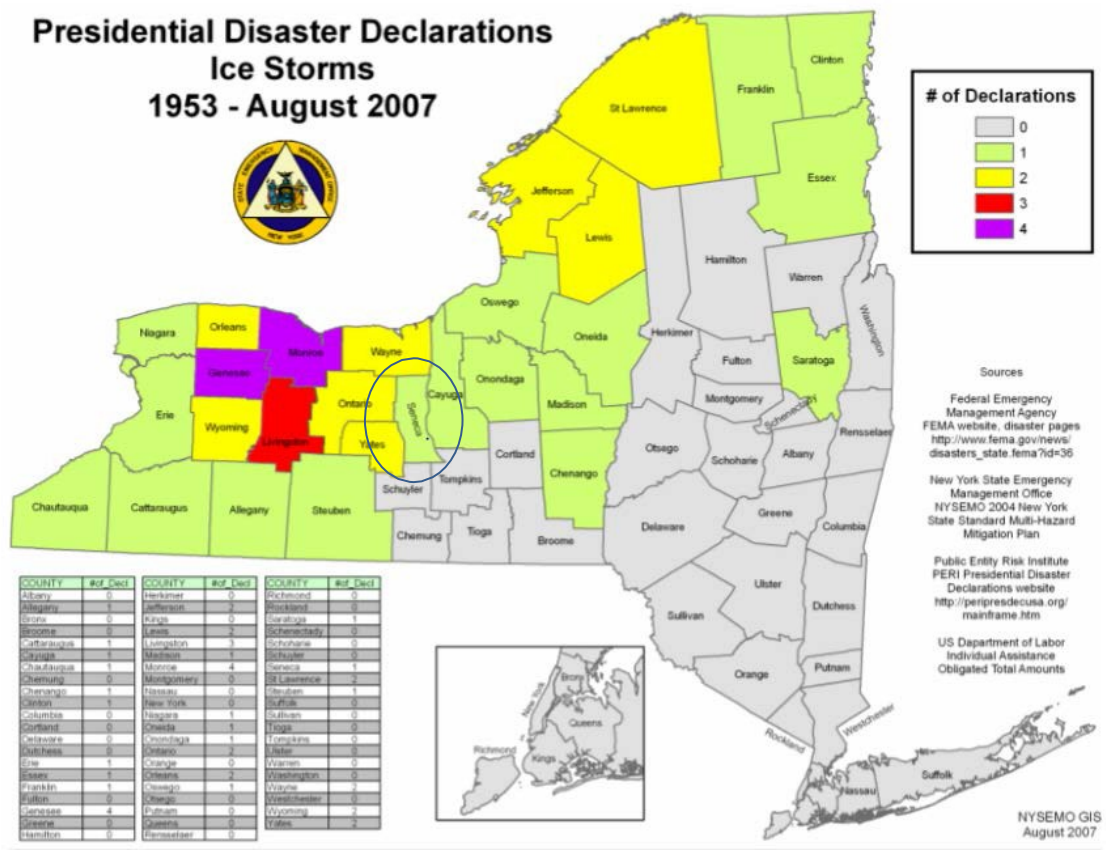
7 Ice Storm Event(s) were reported in Seneca County between 1/01/1999 and 2/28/2016
Source: NOAA National Climatic Data Center

Ice Storm Date	Reported Damages
01/02/1999	
02/13/2000	
02/25/2001	
04/04/2003	$ 2 Million
01/15/2007	
03/04/2008	
03/07/2008	$ 5,000

Ice Storm History

Ice storms deposit layers of ice upon roadways, sidewalks, trees, power, and telephone lines generally causing widespread power outages, major damage and sometimes deaths. Luckily, ice storms occur far less frequently than storms that deposit significant quantities of snow and/or sleet. There have been two major ice storms in western (1991) and northern (1998) New York that caused significant damage and disruption to counties that border Seneca. Both storms caused power outages lasting for weeks, extensive property damage, deaths and economic loss.

The ice storm that most seriously impacted Seneca County was on April 4-5, 2003 when areas of the Finger Lakes reported freezing rain and ice accumulation up to 1 inch. Power outages, downed limbs and wires, damage to homes and structures were reported across Seneca County and the region. Seneca County reported $2 million in damage and emergency service costs associated with this storm and received a federal disaster declaration to help with the recovery. The ice storm of March, 2008 produced one-quarter to three-quarters of an inch of ice accumulation across Seneca County and $5,000 in damages were reported. When the major ice storms affected neighboring regions of New York – 1991 in Rochester and the Genesee Valley and 1998 in the North Country – temperatures were slightly milder in Seneca County and the storm resulted in rain, mixed precipitation and minor flooding, but not ice build-up.



COUNTY	#of_Decl
Albany	0
Allegany	1
Bronx	0
Broome	0
Cattaraugus	1
Cayuga	1
Chautauqua	1
Chemung	0
Chenango	1
Clinton	1
Columbia	0
Cortland	0
Delaware	0
Dutchess	0
Erie	1
Essex	1
Franklin	1
Fulton	0
Genesee	4
Greene	0
Hamilton	0

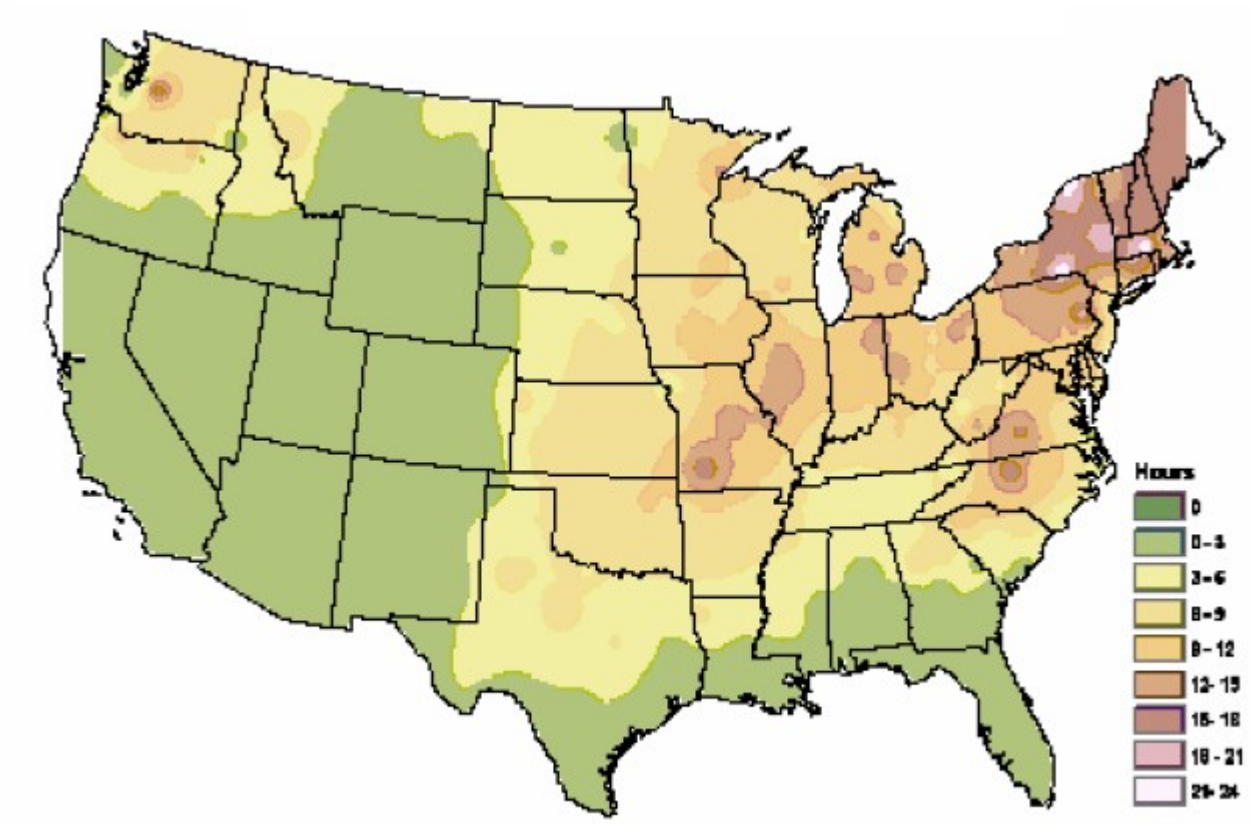
COUNTY	#of_Decl
Herkimer	0
Jefferson	2
Kings	0
Lewis	2
Livingston	3
Madison	1
Monroe	4
Montgomery	0
Nassau	0
New York	0
Niagara	1
Oneida	1
Onondaga	1
Ontario	2
Orange	0
Orleans	2
Oswego	1
Otsego	0
Putnam	0
Queens	0
Rensselaer	0

COUNTY	#of_Decl
Richmond	0
Rockland	0
Saratoga	1
Schenectady	0
Schoharie	0
Schuyler	0
Seneca	1
St Lawrence	2
Steuben	1
Suffolk	0
Sullivan	0
Tioga	0
Tompkins	0
Ulster	0
Warren	0
Washington	0
Wayne	2
Westchester	0
Wyoming	2
Yates	2

Ice Storm Risk Summary

Ice storms are often considered an associated hazard of winter storms and evaluated as part of the overall winter storm threat. In Seneca County, however, due to the history and potential for severe icing - and because other major ice storms have resulted in significant damages and community impacts in neighboring areas - it has been determined that Ice Storms are a *'Hazard of Concern'* for Seneca County.

Average Hours per Year with Freezing Rain



Source: "FREEZING RAIN EVENTS IN THE UNITED STATES", National Climatic Data Center, Asheville, North Carolina

Hazard Profile – Earthquake

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Earthquake *Definition:* An earthquake occurs when two of the earth's geologic plates or layers shift, causing vibrations, and/or shaking at and below the earth's surface *Impact Area:* Countywide	None	Death and Injuries Property and structural damage Damage to roads, utilities, bridges, infrastructure Stranded or trapped residents and victims Rescue operations and other high risk response Breakdown of emergency communications Disruption of transportation Delayed access for emergency services Fire risks from ruptured gas lines Damage to flood protection systems Shelter, feeding and temporary housing Economic impacts, property value and tax losses Employment and business disruption and losses Damage to natural features and habitat Increased health risks Contamination and disease Water supply contamination Secondary hazardous materials exposure Threat to dams and secondary flooding Power outages Increased demand for health/medical services Increased need for human and social services Disruption of home medical and care services Disrupted access for pharmacy and health needs Crisis counseling and mental health services Institutional threats; prisons, nursing homes, etc.	There is a 10% chance over 50 years of a minor earthquake occurring in Seneca County that would produce noticeable shaking but no damages There are no reliable or accurate methods for predicting the probability of a severely damaging earthquake in Seneca County The NYS Hazard Mitigation Plan calculates that a damaging earthquake will occur somewhere in the state on average once every 22 years; and that a damaging earthquake is most likely to occur in the North Country, NYC/Long Island or Western NY regions of the state

Earthquakes are a potential natural hazard across all of New York State and the entire northeastern United States. The earthquake hazard in New York is often underestimated because other severe natural hazards with high visibility occur more frequently; particularly hurricanes, tornadoes and flooding. While a devastating earthquake is less likely, a catastrophic earthquake could cause widespread damage that few other hazards can match.

There has not been any recorded earthquake occurrence or reports of earthquake damage in Seneca County and other areas of New York are considered to be at greater risk. Local residents have felt tremors and shaking from earthquakes that have occurred elsewhere in the northeast and other counties in upstate New York have had damaging earthquakes.

The New York State Office of Emergency Management and New York Geological Survey report there have been four earthquakes in New York State with magnitudes greater than 5.0 in the last 100 years; the largest was a 5.8 in Massena in 1944. Earthquakes of these magnitudes are considered 'moderate size', falling in the range between magnitudes 5.0 to 6.0 on the Richter scale. A magnitude 5.0 earthquake in June 2010 was centered north of Ottawa, Canada and felt through all of New York State, but did not result in any damage. In contrast, minor earthquakes with magnitudes less than 3.0 are common in New York State and occur on average, about once a week. These low magnitude earthquakes often go unfelt, or are only felt by citizens in the immediate vicinity of the epicenter. The type of soil in any area can substantially influence earthquake risk; for instance, amplification or strengthened shaking and ground motion occurs in softer soils. The predominant soil classifications in Seneca County are sedimentary rock or firm ground at higher elevations and soft to medium clay or sand in the valleys and basins.

Even in a moderate intensity earthquake, there is a relatively low probability of building collapse for typical structures, but a moderate earthquake could cause significant damage to inadequately designed masonry walls, chimneys, foundations, plaster – and can damage underground utilities like gas and water, plus there is danger from falling objects. Damages can easily run to tens of thousands of dollars for affected structures.

Earthquake Probability for Seneca County

According to United States Geological Survey (USGS), the probability of a serious earthquake in Seneca County is less than most other areas of New York State and there is no record of a serious earthquake occurring in Seneca County.

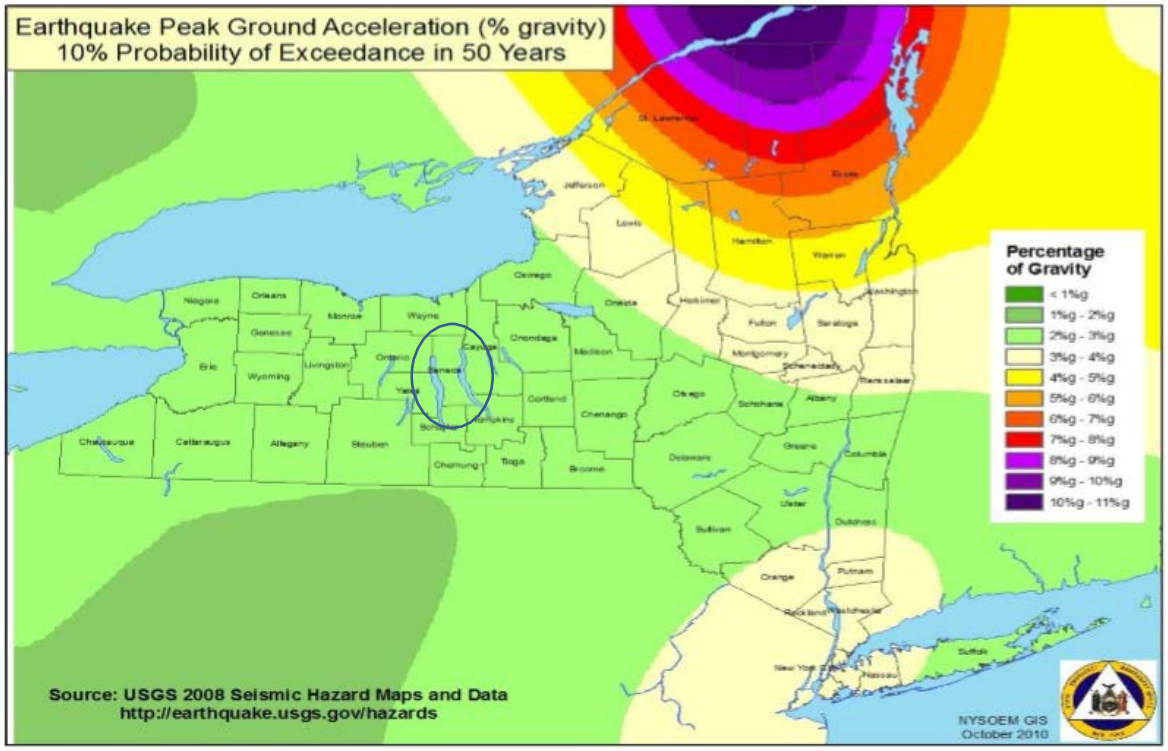
Peak Ground Acceleration (PGA)

Peak Ground Acceleration is a measure of the maximum force experienced at the surface of the ground during an earthquake; or, for any location, PGA represents the strength of ground movement and level of severity at that point. The map below prepared by the USGS uses a given level of PGA

measured as percent of gravity (% g) and estimates the probability that the level will be exceeded over fifty (50) years. This analysis determines the PGA for Seneca County is less than 3% gravity (g), which indicates there is a 10% probability over 50 years that an earthquake will occur in Seneca County that exceeds 3% peak acceleration. If an earthquake where to occur that exceeds 3% g, the next table titled '*Modified Mercalli Intensity (MMI) and PGA Equivalents'* tells us the impact of a stronger earthquake would still only result in limited to light shaking and is not likely to result in any damage. In fact, it's estimated it would take an earthquake of 9.2% PGA to produce strong shaking and light to moderate damage.

PGA and other earthquake evaluation tools are used by architects, building engineers and building code officials to design buildings that will withstand the forces and movement generated by an earthquake. The USGS has determined* that PGA is a good index to use when designing buildings up to about seven (7) stories, which applies to most all structures in Seneca County.

PGA % Seismic Hazard Map (USGS 2008 Seismic Hazard Map)
From the NYS Hazard Mitigation Plan, 2014, Figure 3.7a



Note: Figure 3.7a map is based on USGS 2008 seismic hazard values. The U.S. Geological Survey updated the National Seismic Hazard Maps by incorporating new seismic, geologic, and geodetic information on earthquake rates and associated ground shaking. These 2008 maps supersede versions released in 1996 and 2002.

Modified Mercalli Intensity (MMI) and PGA Equivalents

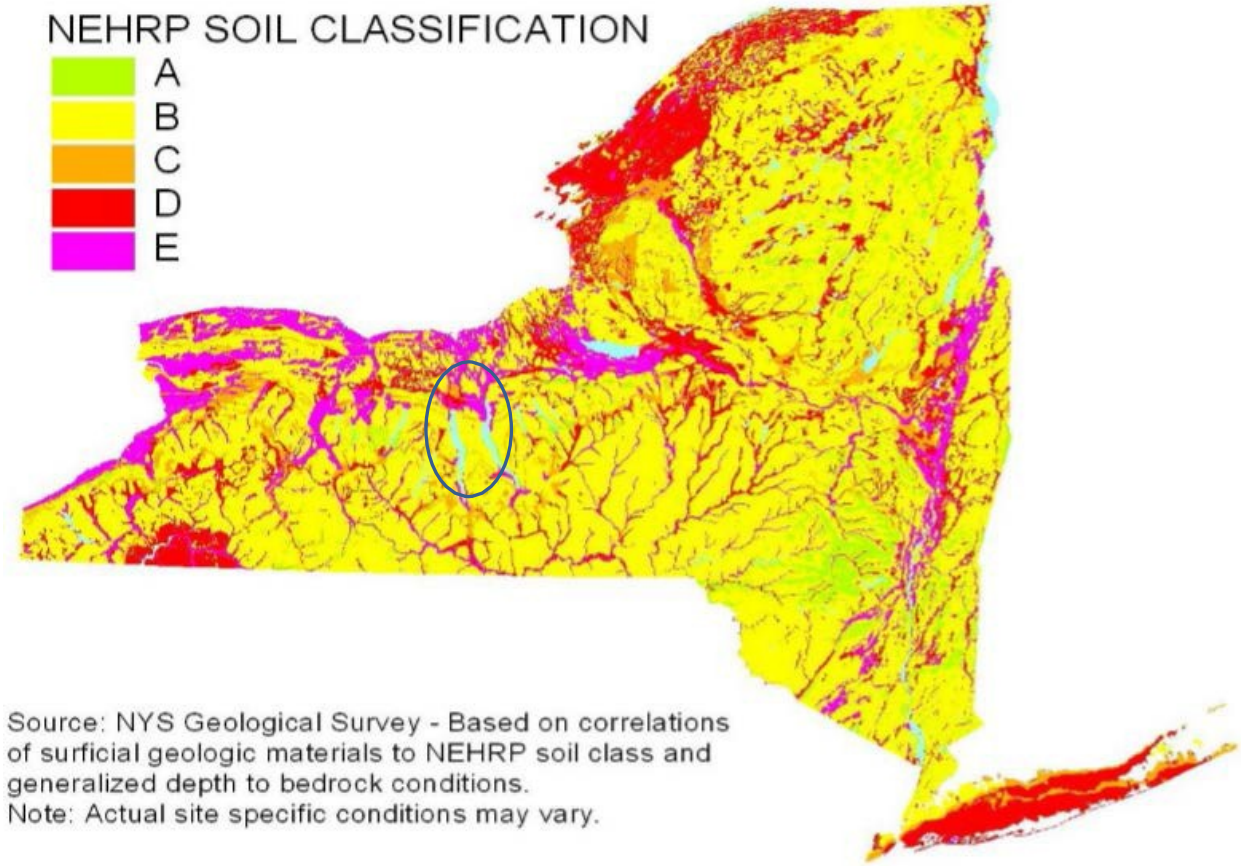
MMI	Acceleration (%g)(PGA)	Perceived Shaking	Potential Damage
I	< .17	Not Felt	None
II	.17 – 1.4	Weak	None
III	.17 – 1.4	Weak	None
IV	1.4 – 3.9	Light	None
V	3.9 – 9.2	Moderate	Very Light
VI	9.2 - 18	Strong	Light
VII	18 – 34	Very Strong	Moderate
VIII	34 – 65	Severe	Moderate to Heavy
IX	65 – 124	Violent	Heavy
X	> 124	Extreme	Very Heavy
XI	> 124	Extreme	Very Heavy
XII	> 124	Extreme	Very Heavy

Source: USGS, 2013

Soil Types

Soil type can substantially affect earthquake risk and the extent of damage that occurs. The National Earthquake Hazard Reduction Program (NEHRP) has categorized New York soils into five classifications as shown next. Class A soils, shown in green, tend to reduce ground motion, while Class E soils, shown in red, tend to further amplify and magnify seismic waves. While the map does not provide the kind of detail or scale needed to determine the specific soil type at any location, it is clear that much of the soil in Seneca County is sedimentary rock and firm ground (shown in yellow) that would produce less ground motion, but central and northern parts of the County are clay and soft soil where ground motion could be greater.

SOIL CLASSIFICATION	TYPES OF SOIL
A	Very hard rock (e.g., granite, gneisses; and most of the Adirondack Mountains)
B	Rock (sedimentary) or firm ground
C	Stiff Clay
D	Soft to medium clays or sands
E	Soft soil (including fill, loose sand, waterfront, lake bed clays)

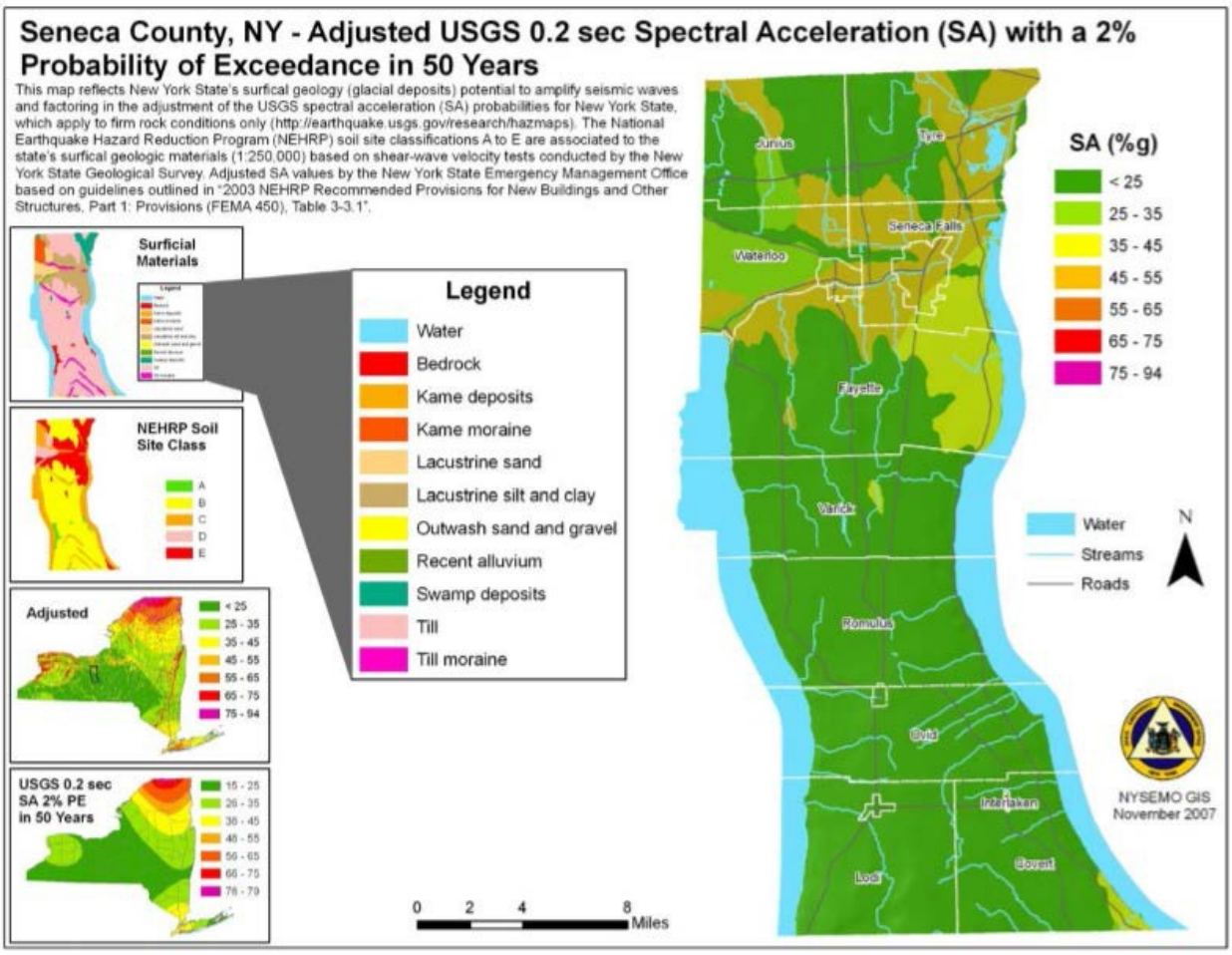


Adjusted Spectral Acceleration (SA)

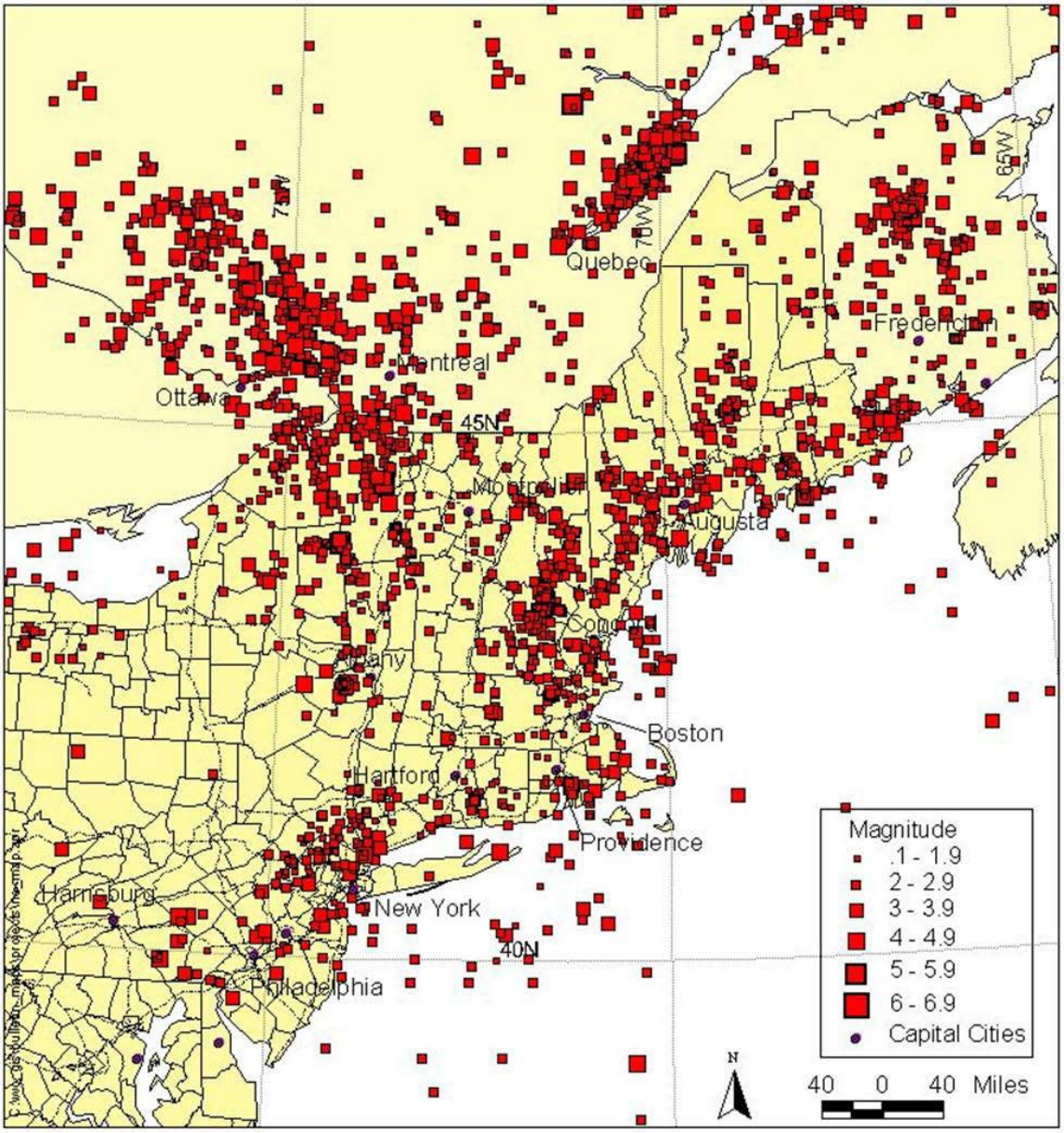
Ground surface measurements like PGA establish how the force and intensity of an earthquake are derived. The true risk and effects of an earthquake, however, must be measured above the ground where it reflects the impacts to buildings and the people at risk inside structures. Spectral Acceleration (SA) approximates the oscillation of ground motion and its effect on building and structures above – or, how a structure will respond to an intensity of movement from the ground below. The SA also adjusts earthquake probability by factoring local soil conditions and their ability to amplify or transfer seismic movement to structures. SA is therefore considered more accurate than PGA in estimating the motion a building or structure can withstand in an earthquake – particularly for taller structures and bridges where height and a condensed ground base increase vulnerability to seismic shaking.

Adjusted Spectral Acceleration was mapped (below) for Seneca County in the NYS Hazard Mitigation Plan (2011) and is available to building officials and professionals engaged in building design and structural engineering. A technical analysis of Spectral Acceleration is complex and beyond the scope of this plan, but those interested can obtain more information from the USGS Earthquake Hazards Program and other technical references.*

* See: USGS Earthquake Hazards Program, Earthquake Hazards 201 – Technical Q & A
https://earthquake.usgs.gov/hazards/learn/technical



Northeast seismic activity from October, 1975 - March, 2010
Source: USGS



Probability of Future Earthquake Events

Although there's a 100 percent chance at any given moment for an earthquake to occur, many people may never experience a quake. The seismic waves are often so light they can only be detected by exceptionally sensitive instruments. According to USGS, there are an estimated 700 shocks each year with the capability of shaking homes, rattling windows, displacing objects; and some strong enough to cause property damage, death, and injury. Fortunately, many of these potentially devastating earthquakes are centered in unpopulated areas with little or no structural development.

The science and technology of estimating earthquake risks and impacts is advancing rapidly, but predictions are still based on the historical record to show future probabilities. Using such historical information to predict future occurrences, it has been determined by the NYS Geological Survey that NYS can expect a damaging earthquake on average once every 22 years. Furthermore, earthquakes are more likely to occur within one of four (4) regions; 1) Western NY, particularly north and east of Buffalo, 2) North Country Northeast, 3) Capital District to the upper Hudson Valley and 4) the lower Hudson Valley, NYC and Nassau.

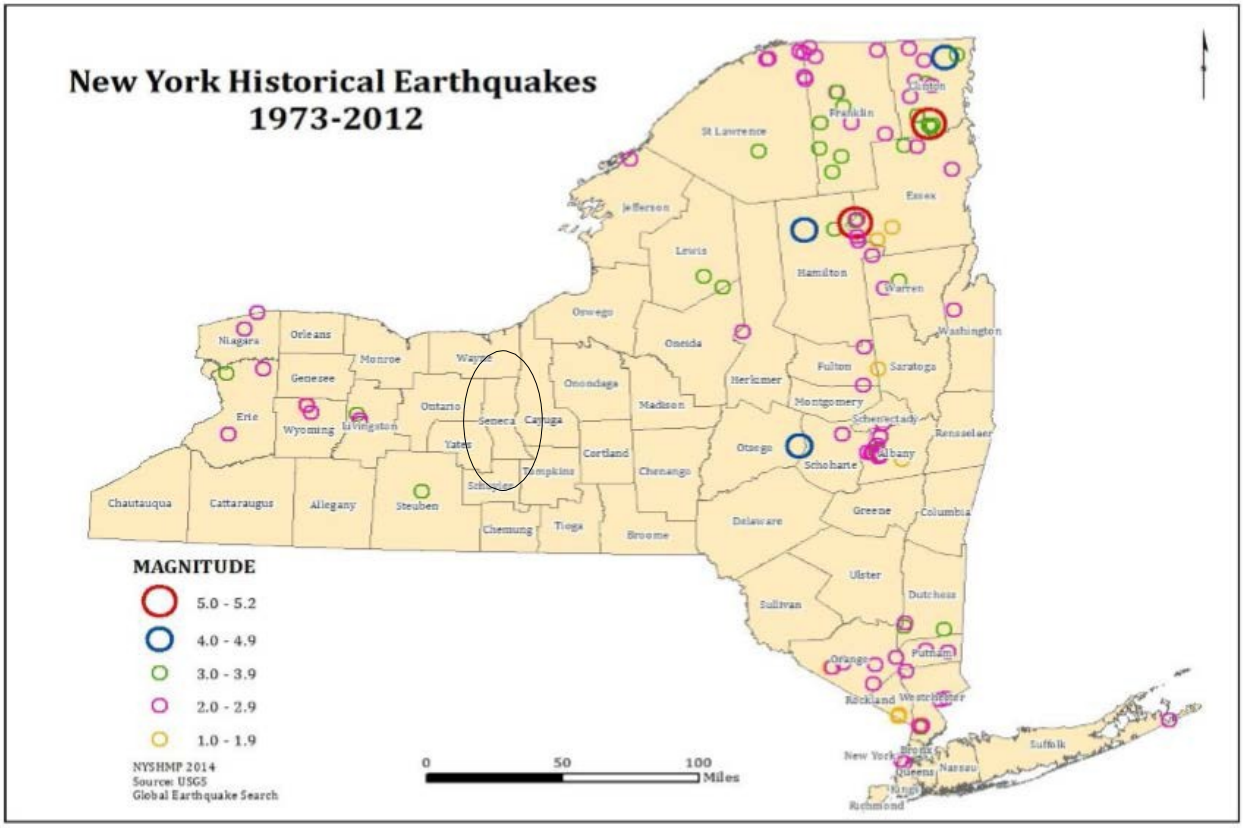
The NYSGS study by W. Mitronovas, '*Earthquake Hazard in New York State'* determines that an earthquake of magnitude 3.5 to 4 will occur on average every three (3) years somewhere in the State.* Earthquakes of this intensity do not cause appreciable damage (except for cracks in plaster, perhaps) but they are large enough to be felt strongly by many people near the epicenter.

The NYS Hazard Mitigation Plan cites the New York City Earthquake Consortium (NYCEM) study where it is estimated that a Richter magnitude 5.0 earthquake with moderate severity has a 2% probability of occurring in the New York area within the next 50 years.**

In summary, the frequency of damaging earthquakes within and adjacent to New York State has been relatively low. However, because severe and damaging earthquakes have occurred previously in the region – and combined with the State's high population density and number of old deteriorating buildings – it is widely held that all areas of New York State are at risk from damaging earthquakes.

* New York State Department of Homeland Security and Emergency Services (DHSES), Hazard Mitigation Plan, 2014
http://www.dhses.ny.gov/recovery/mitigation/documents/2014 (Section-3-7-Earthquake)

** New York City Consortium for Earthquake Loss Mitigation (NYCEM)
http://www.nycem.org


New York Historical Earthquakes
1973-2012
MAGNITUDE
5.0 - 5.2
4.0 - 4.9
3.0 - 3.9
2.0 - 2.9
1.0 - 1.9
NYSHMP 2014
Source: USGS
Global Earthquake Search
0
50
100
Miles
St Lawrence
Franklin
Clinton
Essex
Jefferson
Lewis
Hamilton
Warren
Washington
Oswego
Oneida
Herkimer
Fulton
Saratoga
Niagara
Orleans
Monroe
Wayne
Genesee
Onondaga
Madison
Montgomery
Schenectady
Erie
Wyoming
Livingston
Ontario
Seneca
Cayuga
Yates
Cortland
Otsego
Schoharie
Albany
Rensselaer
Tompkins
Chenango
Chautauqua
Cattaraugus
Allegany
Steuben
Schuyler
Chemung
Tioga
Broome
Delaware
Greene
Columbia
Ulster
Sullivan
Dutchess
Orange
Putnam
Rockland
Westchester
New York
Bronx
Queens
Nassau
Kings
Richmond
Suffolk

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Section V Vulnerability Assessment

A. Vulnerability Overview

The purpose of the vulnerability assessment is to identify and characterize property and populations at risk from potential hazards. The types of hazards that impact a community and the potential scope or intensity of the hazard combine with the vulnerability of people, property, facilities and services to define the overall threat and outcomes of a disaster. The vulnerability assessment for Seneca County looks at the following six (6) factors to determine potential vulnerability to the communities, people, infrastructure, facilities and services.

- Vulnerable Populations
- Impact on Improved Property
- Evaluation of Repetitive Loss Properties
- Vulnerability of Critical Facilities, Infrastructure and Services
- Potential Disaster Costs and Losses
- Consideration of Future Growth and Development

B. Vulnerable Populations

Jurisdiction	2015 Population[1]	14 years of age and under[1]	65 years of age and over[1]	[a]Families below poverty level[1]	[b]Persons 5 years and older with a disability[1]
Covert, T	2,328	365	530	123	115
Fayette, T	3,918	718	639	104	529
Interlaken, V	703	104	101	26	105
Junius, T	1,401	331	197	34	117
Lodi, T	1,636	229	300	4	272
Lodi, V	404	55	42	20	58
Ovid, T	2,166	408	396	67	334

Jurisdiction	2015 Population[1]	14 years of age and under[1]	65 years of age and over[1]	[a]Families below poverty level[1]	[b]Persons 5 years and older with a disability[1]
Ovid, V	602	129	86	18	98
Romulus, T	4,359	417	435	53	279
Seneca Falls, T	9,347	1,461	1,530	315	1,490
Tyre, T	1,023	231	121	16	134
Varick, T	1,795	346	377	110	244
Waterloo, T	7,568	1,360	1,357	266	1,384
Waterloo, V	5,048	997	921	151	624

Sources: **[1]U.S. Census 2015 Estimate, American Community Survey**

a Includes income and benefits. Average number of persons per household in Seneca County is 2.51 (2010). The U.S. Department of Health and Human Services calculated the 2016 poverty level to be $20,160 for a family of three.

b 2015 estimates using 2011-2015 data for the non-institutional population. Includes persons 5 years and older that report having a long-lasting sensory, physical, mental or self-care disability; and those that report difficulty going outside the home or have difficulty working at a job because of a physical, mental or emotional condition.

continue to the next page

C. Improved Property

2015 Parcel Counts by Property Class Code

Seneca County		
Broad Use Category	**Description**	**Parcel Count**
100	Agricultural Properties	1,752
200	Residential Properties	11,121
300	Vacant Land	2,448
400	Commercial Properties	735
500	Recreation and Entertainment Properties	66
600	Community Service Properties	335
700	Industrial Properties	206
800	Public Service Properties	594
900	Public Parks, Wild, Forested and Conservation Properties	95
Total Parcels in All Broad Use Categories		18,043

Source: NYS Office of Real Property Tax Services

Improved Property - Parcel Counts and Assessed Values

2015 Parcel Counts and Assessment by Property Class Code **Town of Covert and Village of Interlaken**		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	192	$20,594,000
Residential	1,017	$152,793,415
Commercial	44	$5,430,400
Recreation / Entertainment	4	$642,000
Community Service	29	$12,147,000
Industrial	3	$486,000
Public Service	38	$6,547,247
Parks / Conservation	9	$1,187,000

2015 Parcel Counts and Assessment by Property Class Code **Town of Fayette**		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	379	$46,553,982
Residential	1,514	$196,868,170
Commercial	54	$13,450,200
Recreation / Entertainment	11	$8,112,200
Community Service	35	$13,822,300
Industrial	155	$2,159,100
Public Service	85	$22,415,449
Parks / Conservation	4	$43,700

Improved Property - Parcel Counts and Assessed Values (continued)

2015 Parcel Counts and Assessment by Property Class Code Town of Junius		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	168	$13,189,000
Residential	479	$38,490,000
Commercial	19	$38,722,600
Recreation / Entertainment	3	$898,600
Community Service	20	$8,211,000
Industrial	9	$2,308,000
Public Service	50	$6,848,000
Parks / Conservation	5	$666,000

2015 Parcel Counts and Assessment by Property Class Code Town and Village of Lodi		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	182	$23,463,600
Residential	730	$85,213,100
Commercial	20	$2,730,000
Recreation / Entertainment	3	$1,211,000
Community Service	19	$4,335,300
Industrial	0	NA
Public Service	20	$2,697,100
Parks / Conservation	52	$4,860,000

2015 Parcel Counts and Assessment by Broad Use Property Class Code Town and Village of Ovid		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	209	$26,182,800
Residential	891	$110,062,500
Commercial	60	$9,106,100
Recreation / Entertainment	3	$2,408,600
Community Service	34	$27,659,100
Industrial	0	NA
Public Service	26	$9,538,500
Parks / Conservation	2	$922,300

Improved Property - Parcel Counts and Assessed Values (continued)

2015 Parcel Counts and Assessment by Broad Use Property Class Code Town of Romulus		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	165	$21,727,000
Residential	790	$116,643,600
Commercial	30	$3,707,700
Recreation / Entertainment	3	$2,058,000
Community Service	43	$480,290,100
Industrial	0	NA
Public Service	39	$5,577,200
Parks / Conservation	0	NA

2015 Parcel Counts and Assessment by Broad Use Property Class Code Town of Seneca Falls		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	62	$3,030,000
Residential	2,946	$270,405,000
Commercial	279	$99,705,600
Recreation / Entertainment	20	$8,014,200
Community Service	58	$70,633,500
Industrial	29	$28,283,300
Public Service	95	$36,600,000
Parks / Conservation	3	$150,300

2015 Parcel Counts and Assessment by Broad Use Property Class Code Town of Tyre		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	166	$18,369,000
Residential	329	$25,807,000
Commercial	10	$12,515,000
Recreation / Entertainment	1	$44,400
Community Service	20	$2,780,000
Industrial	4	$7,900
Public Service	76	$7,906,000
Parks / Conservation	16	$1,986,000

Improved Property - Parcel Counts and Assessed Values (continued)

2015 Parcel Counts and Assessment by Broad Use Property Class Code Town of Varick		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	168	$29,122,000
Residential	707	$122,101,400
Commercial	14	$1,537,000
Recreation / Entertainment	0	NA
Community Service	17	$20,223,000
Industrial	2	$114,700
Public Service	73	$3,095,000
Parks / Conservation	0	NA

2015 Parcel Counts and Assessment by Broad Use Property Class Code Town and Village of Waterloo		
Property Use	**Number of Parcels**	**Total Assessed Value**
Agriculture	61	$5,433,000
Residential	2,409	$181,768,000
Commercial	205	$55,849,000
Recreation / Entertainment	18	$6,849,000
Community Service	60	$114,789,000
Industrial	4	$3,180,000
Public Service	92	$26,056,500
Parks / Conservation	4	$352,000

Source: NYS Office of Real Property Tax Services, Municipal Profiles, 2015

Note: Property assessment administration and reports for villages are consolidated with the respective township

D. Evaluation of Repetitive Loss Properties

National Flood Insurance Program (NFIP)

1. Community Participation in the National Flood Insurance Program

- 11 of 14 Seneca County jurisdictions participate in National Flood Insurance Program (NFIP)
- There are 5 *Repetitive Loss Properties* (RLP) identified in Seneca County
- There are no *Severe Repetitive Loss Properties* in Seneca County
- 126 (43%) of 294 NFIP policies insure properties in the high-risk flood areas (Zone A)
- No Seneca County jurisdictions participate in the *Community Rating System (CRS)*

Seneca County	
Jurisdictions Participating in NFIP	
CID	**Jurisdiction**
360751	Covert, T
360752	Fayette, T
360753	Lodi, T
361603	Lodi, V
360754	Ovid, T
360755	Romulus, T
360756	Seneca Falls, T
361206	Tyre, T
360758	Varick, T
360759	Waterloo, T
360760	Waterloo, V
Jurisdictions not Participating in NFIP	
Interlaken, V	
Junius, T	
Ovid, V	

Source: FEMA National Flood Insurance Program Community Status, 2017

Jurisdictions Not Participating in NFIP

The Town of Junius and Villages of Interlaken and Ovid have chosen not to participate in the NFIP. These communities should regularly evaluate and reconsider participation, since even in areas where flood damages seem minimal, there are benefits to NFIP participation for citizens and property owners. Later in this section, part F discusses flood risks and vulnerabilities for Seneca County. It notes that Seneca is one of three counties in the State that have the least vulnerability to flooding, and for Seneca County these three communities have few and minor reports of damaging floods. Still, flooding has and will occur in these communities and NFIP participation provides an important measure of protection for residents and property owners.

Communities participating in the NFIP commit to applying floodplain management principals in their development policies and administer Floodplain Management Regulations as part of their building and construction codes. They also help residents obtain information on flood hazards, floodplain map data, flood insurance and proper construction methods in the floodplain.

Local Floodplain Administrators		
Jurisdiction	Name	Title
Covert	John Poludniak	Code Enforcement
Fayette	Robert Steele	Land Use Officer
Interlaken	None	
Junius	None	
Lodi, T	E. Lee Davidson	Supervisor
Lodi, V	None	
Ovid, T	Wes Prouty	Supervisor
Ovid, V	NA	
Romulus	David Kaiser	Supervisor
Seneca Falls	Dean Zettlemoyer	Code Officer
Tyre	Craig Reynolds	Zoning Officer
Varick	Tim Dorn	Code Enforcement
Waterloo, T	Jim Cleere	Zoning Officer
Waterloo, V	Dan Driscoll	Zoning Officer

2. Repetitive Loss Properties (RLP)

National Flood Insurance Program (NFIP) data presents one of the strongest and most reliable indicators of the location and severity of flood events. One measure contained in the NFIP statistics, the list of Repetitive Loss Properties (RLP) identifies sites that have been repeatedly flooded and where multiple claims for flood losses have been made through the NFIP fund.

Certain repetitive loss properties represent a significant portion of annual flood insurance program claims. In 2004, NFIP calculated that only about 1 percent of properties insured by NFIP are repetitive loss properties -- properties for which policyholders have made two or more $1,000 flood claims -- but approximately 38 percent of all NFIP claim costs were the result of damage to repetitive loss properties. Federal action was authorized to reduce program losses by targeting repetitive loss properties and setting priorities to use hazard mitigation grant funds to buy-out or retrofit repetitive loss properties, thus eliminating flood risks and reducing flood recovery costs. The strategy also includes proposals to phase out coverage or begin charging full and actuarially based rates for repetitive loss property owners who refuse to accept FEMA's offer to purchase or mitigate the effect of floods on their structures.

Source: National Flood Insurance Program, Actions to Address Repetitive Loss Properties, 2004

Repetitive Loss Properties in Seneca County

Jurisdiction	Number of Repetitive Loss Properties *	Number of NFIP Claims	Total NFIP Loss Payments
Fayette, T	1	2	$26,481
Ovid, T	2	4	$88,896
Seneca Falls, T	2	4	$33,023

* All are single family homes **Source: NFIP, 2017**

Data privacy policies apply -- contact the Municipal Floodplain Management Coordinator or the Seneca County Planning and Community Development Department for specific property locations and information.

Federal mitigation grant funding available to counties and municipalities is often targeted to address improvements that will prevent flooding or eliminate flood losses affecting Repetitive Loss Properties. Local governments should consider mitigation improvements and projects that will limit losses to the RLP sites noted above; which can include acquisition, relocation and retrofitting of public and private flood-prone properties. Potential improvements or projects to address flood risks to these properties, even those that are only a proposal or under consideration, should be included in Section VI, Hazard Mitigation Strategies of this plan.

3. Severe Repetitive Loss Properties (SRL)

The National Flood Insurance Program (NFIP) identifies Severe Repetitive Loss (SRL) Properties to promote and encourage actions that will reduce or eliminate the long-term risk of flood damage to targeted structures that are insured under NFIP. A SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

(a) has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or

(b) for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period and must be greater than ten (10) days apart.

The SRL program helps communities and property owners who have suffered repeated flood damage by providing federal funds to buy-out, elevate or floodproof the property and eliminate the risk of future damage. The program also protects the lives of local responders and reduces the burden of future response and recovery costs to the state and local governments, plus it eliminates future claims through the NFIP fund. In New York State, approved SRL funding often covers up to 90% of the project costs.

Through 2017, there are no *Severe Repetitive Loss Properties* in Seneca County

Source: NFIP, 2017

4. Community Rating System (CRS)

Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary program of the National Flood Insurance Program (NFIP) where communities and property owners can take advantage of incentives and are eligible for flood insurance rate discounts when they go beyond minimum floodplain management requirements and implement extra flood prevention measures and enhanced actions for flood protection.

There are currently no Seneca County communities participating in the CRS

NFIP Policies and Coverage

Community	# of NFIP Policies	A Zone Policies*	Coverage in Force	NFIP Claims 1978 - 2016	NFIP Claims Paid 1978 - 2016
Covert, T	24	24	$3,965,400	5	$13,811
Fayette, T	21	15	$3,827,700	10	$79,358
Interlaken, V	0				
Junius, T	0				
Lodi, T	13	11	$2,273,100	4	$36,912
Lodi, V	1	1	NA	1	$23,712
Ovid, T	16	8	$4,288,600	11	$128,386
Ovid, V	0				
Romulus, T	15	10	$2,762,700	9	$6,499
Seneca Falls, T	35	23	$6,904,100	35	$156,388
Tyre, T	1	1	$80,000	0	
Varick, T	29	16	$4,847,000	10	$17,699
Waterloo, T	8	8	$982,900	2	$2,077
Waterloo, V	5	0	$1,214.900	2	$2,148

Source: NFIP Policy and Loss Statistics, 2017

*** Zone A** - Areas with a 1% chance of flooding each year, and a 1-in-4 chance of flooding over the life of a 30-year mortgage. In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to improved properties in Zone A.

FEMA emphasizes that over 20% of NFIP claims are received from properties in lower risk areas outside Zone A, and that one-third of funding for flood assistance is provided to properties outside the high hazard zone.

Source: NFIP FloodSmart,gov 2012

E. Critical Facilities

Note: The following table refers to facilities or structures in each jurisdiction that are essential to the continued delivery of public services. It describes the political jurisdiction where facilities are located and does not address agency service areas, which often differ from political boundaries.

Location	Government Operations	Fire Stations	Police Stations	EMS / Ambulance Stations	Hospitals and Nursing Homes*	Emergency Communications
Covert, T	Covert Town Hall Interlaken Covert Town Highway Interlaken					
Fayette, T	Fayette Town Offices Yellow Tavern Rd Fayette Highway/ Water Yellow Tavern Rd	Fayette FD				
Interlaken, V	Interlaken Village Hall Interlaken Public Works	Interlaken FD	Interlaken Police Dept.			
Junius, T	Junius Town Hall Dublin Rd Junius Town Highway Dublin Rd	Junius FD				
Lodi, T	Lodi Town Hall Main St Lodi Highway Dept Mill St					
Lodi, V	Lodi Village Office Main St	Lodi FD				

Location	Government Operations	Fire Stations	Police Stations	EMS / Ambulance Stations	Hospitals and Nursing Homes*	Emergency Communications
Ovid, T	Ovid Town Hall Orchard St Ovid Highway Dept County Road 129 NYS Willard Drug Treatment Campus					
Ovid, V	Ovid Village Hall Main St Ovid DPW Main St. Seneca County Ovid Mental Health Office Seneca County Ovid Courthouse	Ovid FD				Ovid Communications Tower
Romulus, T	Romulus Town Hall Willard Romulus Highway Department County Road 129 Seneca County Highway Bldgs. Seneca County Corrections Facility Seneca County Public Safety Training Center Seneca Army Depot County Facilities	Romulus FD	Seneca County Law Enforcement Center	South Seneca Ambulance Station		

Location	Government Operations	Fire Stations	Police Stations	EMS / Ambulance Stations	Hospitals and Nursing Homes*	Emergency Communications
Seneca Falls, T	Seneca Falls Town Offices 130 Ovid St W Bayard St Seneca Falls Highway Dept 187 Ovid St Seneca County Finger Lakes Airport Seneca County Drop-In Center Cayuga St	Canoga FD Red Jacket FD East Station Red Jacket Seneca Falls West Station	Seneca Falls Police Department			
Tyre, T	Tyre Municipal Building Route 318 Tyre Highway Dept Middle Black Brook	Magee FD				
Varick, T	Varick Town Hall / Garage State Route 96	Varick FD				Hillside Tower
Waterloo, T	Waterloo Municipal Offices Virginia St Waterloo Highway Department	Border City Hose Station Border City Serven Company	NY State Police Station	North Seneca Ambulance Station		Burgess Road Tower

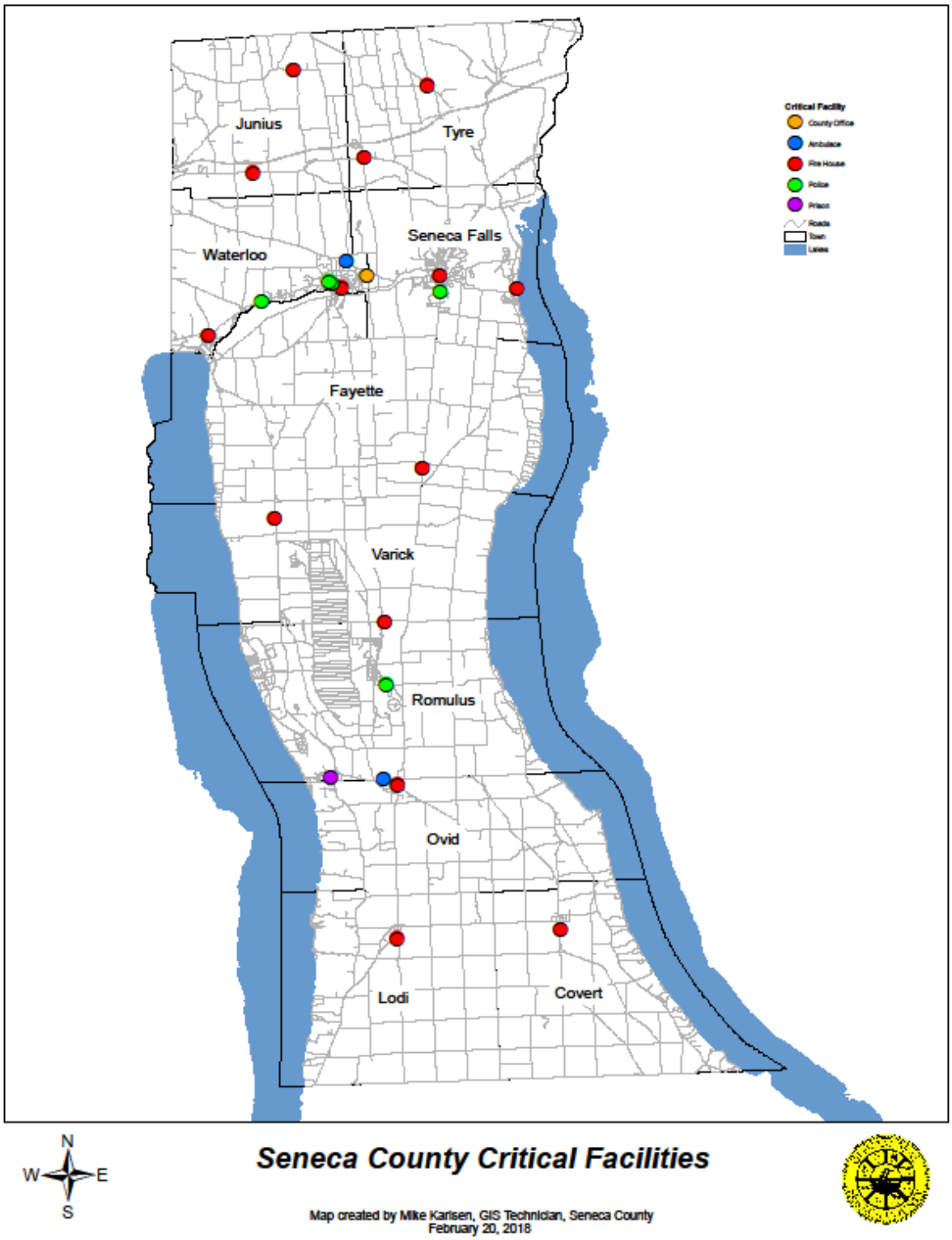
Location	Government Operations	Fire Stations	Police Stations	EMS / Ambulance Stations	Hospitals and Nursing Homes*	Emergency Communications
Waterloo, V	Waterloo Village Office Building Main St Waterloo DPW Seneca County Office Bldg. Seneca County Health Building Seneca County 44-48 W William St. Complex	Waterloo FD	Waterloo Police Department Seneca County Sheriff Sub-Stations		Huntington Living Center Seneca Nursing & Rehabilitation Center	Seneca County Office Bldg. 44-44 W. William Complex

Note: All communities have service coverage, although facilities may be located in adjoining jurisdictions or service is provided from a regional location

* Hospital and emergency room care are available in neighboring counties

Critical Facilities noted above are not located in special Flood Hazard Areas and there are no records or recollections that existing critical facilities have experienced flooding

Fire and Police Stations, EMS Facilities, County Buildings and Jail



Critical Facilities - Community Shelters

Community Shelters *	
Jurisdiction	**Reception, Food and Shelter Sites**
Ovid, T Ovid, V	South Seneca Middle/High School
Romulus, T	Romulus K-12 School
Seneca Falls, T	Magee Fire Hall New York Chiropractic College Elizabeth Cady Stanton Elementary School Frank Knight Elementary School Mynderse Academy Senior/Junior High School
Waterloo, T Waterloo, V	Waterloo High School Waterloo Middle School Skoi-Yase Primary School South Seneca Elementary School LaFayette Intermediate School

* This table is intended for community hazard mitigation planning use and lists only shelters within Seneca County and the jurisdiction where the shelter is physically located. Emergency shelters are available to all county residents, although the shelter may be located in a nearby jurisdiction, or in some cases an adjacent county.

Not all shelters listed have generators; this list includes only shelter sites that are considered critical facilities. Contact Seneca County Emergency Services for more information

For instructions regarding all county shelter sites and directions to a shelter in your area, refer to the Seneca County Emergency Plan or contact the Seneca County Emergency Management Office at 518-295-2276

Critical Facilities – Roads and Bridges

Jurisdiction	Highway Miles[1]	Bridges[2]	
		Local	County
Seneca County	156.2		14
Covert, T	41.7	2	2
Fayette, T	63.6	1	3
Interlaken, V	1.7	0	0
Junius, T	34.5	0	0
Lodi, T	43.5	3	1
Lodi, V	0.9	0	1
Ovid, T	43.3	4	3
Ovid, V	2.2	0	0
Romulus, T	31.1	0	1
Seneca Falls, T	48.0	2	0
Tyre, T	31.4	0	2
Varick, T	24.1	0	1
Waterloo, T	26.8	0	0
Waterloo, V	18.4	0	0

Highway Miles [1]– total centerline mileage; county and local only, excludes State
Source: NYS Department of Transportation, Highway Inventory (includes names, type and locations)

Bridges[2] - includes county and local, excludes State
Source: NYS Department of Transportation Bridge Data (includes names, type and locations)

Critical Facilities – Public Water Supply

Seneca County Public Water Supply (suppliers in bold)				
Supplier	Supply Facilities	General Area Served	Type / Source	Population Served
Village of Waterloo	Village of Waterloo System	Waterloo, Romulus, Varick, Fayette, Junius and Tyre	Surface Water Seneca Lake	14,000
Varick Water District # 3 (Distributor)		Varick		
Varick Water District # 1 (Distributor)				
Seneca Lake Water District (Distributor)				
Seneca County Water District (Distributor)		Romulus, Varick, Fayette		
Romulus Water District (Distributor)		Romulus Varick		
Fayette Water Districts 1,2,5 and 6 (Distributor)		Fayette		
Town of Seneca Falls	Town of Seneca Falls System	Seneca Falls Fayette	Surface Water Cayuga Lake	9,000
Fayette Water District 3 (Distributor)		Fayette		
Village of Ovid	Ovid	Ovid vicinity	Groundwater well	1525
Village of Interlaken	Interlaken	Interlaken vicinity	Groundwater Well	650
Finger Lakes Mobile Home Park	Waterloo	Private Park	Groundwater Well	35
Willard Campus and Water District	Romulus Ovid	Willard Campus Willard Hamlet	Surface Water Seneca Lake	1,796

Source: New York State Department of Health (NYSDOH), 2017

Critical Facilities – Wastewater Treatment Facilities

Wastewater Treatment Plants in Seneca County		
Location	Operator	Population Served
Interlaken	Interlaken	560
Junius	Junius Sewer District	Unknown
Romulus	Seneca County Five Points	550
Romulus	Seneca County Willard	4,500
Seneca Falls	Seneca Falls	10,000
Varick	Seneca County Hillside	Unknown

Wastewater Treatment Plants (WWTP), like those for Interlaken, Seneca Falls and Waterloo serve municipal populations. Facilities like Five Points and Hillside serve high density population locales. The systems include extensive miles of underground collection infrastructure in their surrounding service district, as well as pump stations and other appurtenances.

Preliminary discussions have occurred about realigning or consolidating County sewer services in southern towns and expanding sewers in Junius and Tyre to address commercial growth.

continue to the next page

Critical Facilities – Public Utilities and Services

Location	Household Heating Source		Natural Gas Service[3]	Electric Distribution	Power Generating Facilities[3]
	Utility Natural Gas or Electric[1]	Local Vendor or Independent Fuels[2]			
Covert, T	192 19%	795 81%	NYSEG	Electric service in all developed areas of Seneca County is provided by New York State Electric & Gas (NYSEG)	
Fayette, T	608 40%	921 60%			
Interlaken, V	34 12%	239 88%	NYSEG		
Junius, T	124 24%	402 76%	NYSEG		
Lodi, T	70 10%	635 90%			
Lodi, V	19 11%	157 89%			
Ovid, T	178 19%	743 81%			
Ovid, V	86 32%	181 68%			
Romulus, T	112 14%	714 86%			
Seneca Falls, T	3,466 89%	408 11%	NYSEG		Seneca Falls Dam Cayuga-Seneca Canal Seneca Meadows Renewable Natural Gas
Tyre, T	41 10%	354 90%	NYSEG		
Varick, T	73 11%	587 89%			
Waterloo, T	2,460 78%	678 22%			
Waterloo, V	1875 96%	80 4%	NYSEG		Waterloo Dam Cayuga-Seneca Canal

[1] Households using public utility natural gas and electric

[2] Vendor provided and independent fuels including LP gas, fuel oil, kerosene, coal, pellets, wood, solar and geothermal

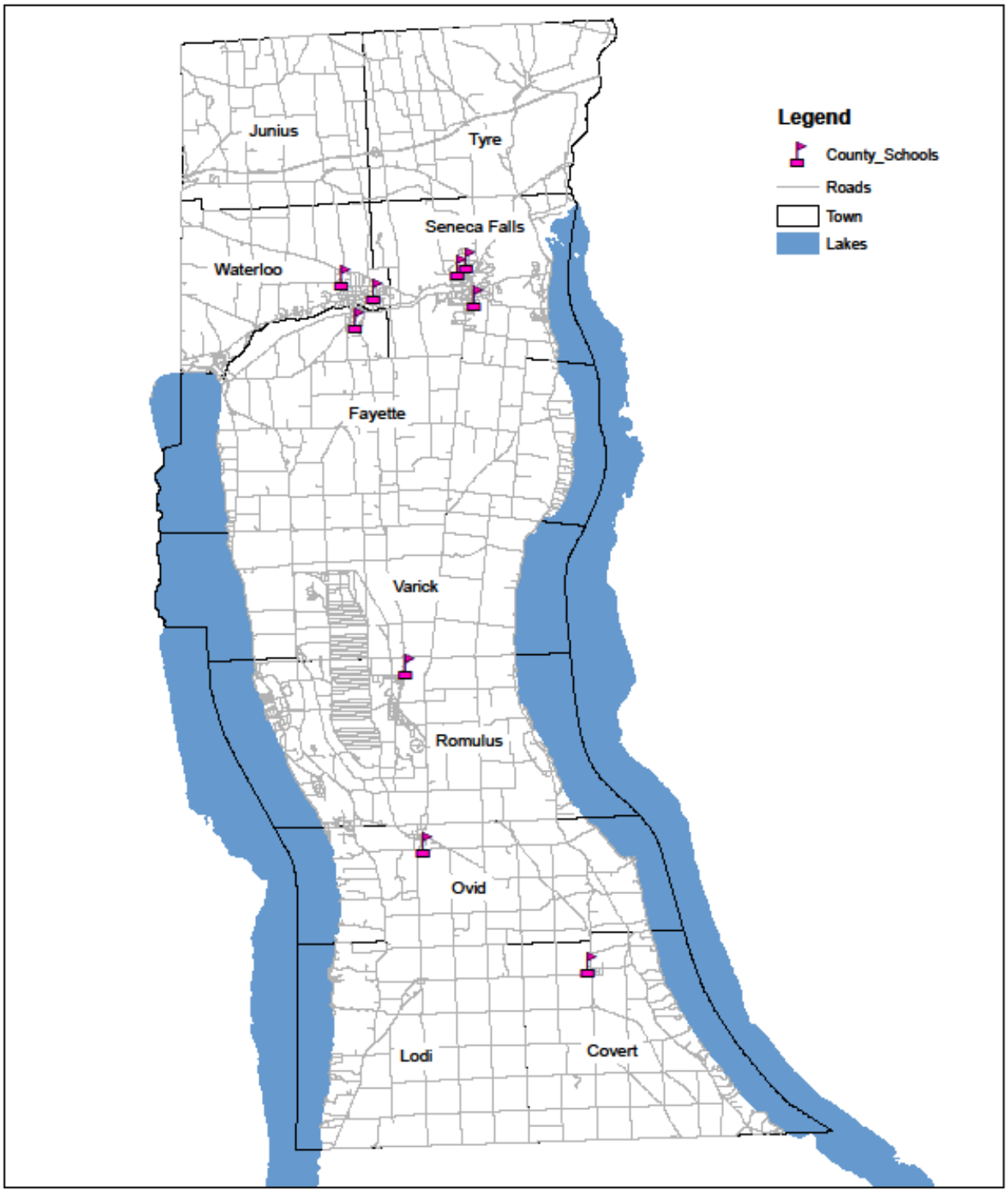
[3] NYSEG natural gas service is provided in portions of northern and southeast Seneca County. Even in communities where gas service exists, it may be limited to higher density and/or commercial areas. Most rural areas do not have natural gas service.

Sources: U.S. Census, American Fact Finder, 2015
New York State Public Service Commission (NYSPSC)

Critical Facilities - Schools and Colleges

Seneca County – Schools and Colleges						
Location	**Public Schools/Colleges**	**# of Students**	**Grades**	**Private Schools/Colleges**	**# of Students**	**Grades**
Interlaken, V	South Seneca Elementary	302	PK-5			
Ovid, T				Lake View School	18	1-8
Ovid, V	South Seneca Middle/High	447	6-12			
Romulus, T	Romulus Central School	451	PK-12	Hillside Children's Center	105	5-12
				Cranberry Marsh School	24	1-8
				Diamond Crossing School	25	1-7
Seneca Falls, T	Mynderse Academy	354	9-12	Seneca Bible Baptist	16	KG-12
	Seneca Falls Middle	295	6-8	Finger Lakes Christian	77	PK-12
	Elizabeth Cady Stanton Elementary	287	3-5	New York Chiropractic College	985	
	Frank M. Knight Elementary	292	KG-2			
Waterloo, T Waterloo, V	Waterloo High School	567	9-12			
	Waterloo Middle School	387	6-8			
	LaFayette Intermediate	371	3-5			
	Skoi-Yase Primary School	393	PK-2			

Note: This table is a listing of school facilities that are located in Seneca County. Seneca County students attend other schools and districts located in neighboring counties that are not included in this list



Seneca County - Public Schools

Map created by Mike Karlsen, GIS Technician, Seneca County
February 20, 2018

Critical Facilities - Historic and Cultural Resources

Sites on National Register of Historic Places		
Jurisdiction	**Historic Sites**	**Historic Districts**
Fayette, T	United Church of Fayette	Covert Historic District Covert Seneca Falls Village Historic District Seneca Falls Fall Street/Trinity Lane Historic District Seneca Falls Women's Rights National Park Seneca Falls
	William Hoster House	
	Rose Hill	
Interlaken, V	First Baptist Church	
Junius, T	Cobblestone Farmhouse 1027Stone Church Rd	
	Cobblestone Farmhouse 1111Stone Church Rd	
	Cobblestone Farmhouse Birdsey Rd	
	John Graves Cobblestone Farmhouse	
Lodi, T	Queen's Castle	
Lodi, V	Lodi Methodist Church	
Ovid, T	David and Mary Kinne Farmstead	
	Aaron Wilson House	
Ovid, V	Seneca County Courthouse	
Romulus, T	Willard Asylum	
Seneca Falls, T	Amelia Bloomer House	
	Julius and Harriet Bull House	
	Fourth Ward School	
	U.S. Post Office	
	Weslyan Methodist Church	
Tyre, T	Hiram Lay Cobblestone Farmhouse	
Varick, T	Simon Ritter Cobblestone Farmhouse	
Waterloo, V	William H. Burton House	
	First Presbyterian Church	
	Hunt House	
	M'Clintock House	
	U.S. Post Office	
	United Methodist Church	
	Waterloo Library	
	James Russell Webster House	
	St. Paul's Church	

F. Estimate of Potential Losses

This section describes hazard vulnerability based on potential dollar losses for hazards related to improved property, community infrastructure, facilities and services**.**

An estimate of potential losses follows for the five (5) natural hazards designated as *'Hazards of Concern'* in Section III, where it was determined the hazard poses a significant risk, or a serious occurrence could have major impacts for improved property in Seneca County.

Flooding	Severe Storms	Severe Winter Storm
Tornado	Ice Storm	

As noted in Section III, Risk Assessment, the threat associated with a Dam Failure or breech was not defined as a principal Hazard of Concern and the historical significance and risk of flooding related to the dams is floodwaters that overtop or back-up behind the dams, thus the vulnerability assessment for flooding applies to high water concerns associated with the dams. The vulnerability linked with Severe Storms is related to wind damage and flooding; thus the impacts of Severe Storms are referenced in the sections for Severe Winter Storm (Wind) and Flooding. No estimate of potential losses for Earthquake was prepared for this plan, because as noted in the Section IV Hazard Profiles, the risk of a severe event in Seneca County is considered very low and vulnerability is less because of the low density population, rural and small village development profile and the absence of high rise structures. For these reasons, the sections prepared for Tornados and Floods can also be used as a reasonable analysis for earthquakes.

A vulnerability assessment is also provided in this section for the following hazards – which were not designated '*Hazards of Concern'* in Section III – but they could have serious consequences for certain groups, areas or populations in Seneca County and it was determined that including an assessment of these hazards would improve overall community preparedness for these events.

Extreme Temperatures	Transportation Accident	Oil Spill
Utility/Power Failure	Hazardous Materials – In Transit	Landslide

Flooding

Nationally and in New York, flooding is the most common and costliest natural disaster. According to the United States Geological Survey (USGS), floods are the most frequent and costly U.S. natural disasters in terms of human hardship and economic loss. The USGS estimates as much as 90% of damage related to natural disasters (excluding drought) are caused by floods. According to the NYS Hazard Mitigation Plan (2014), flooding is the primary natural hazard in New York and damaging floods occur somewhere in the State each year.

Statewide Flood Vulnerability Rankings

The NYS Hazard Mitigation Plan (2011)* prepared a statewide assessment that evaluates and ranks county vulnerability to losses from flooding. In the statewide analysis, all counties are ranked relative to their vulnerability for flood losses, which is a combined rating that factors the history of flooding, density of the population and the potential loss or cost based on NFIP claims and the value of property covered under NFIP policies.

In the state's analysis, each county of New York State was rated using a scale where the least vulnerability to flood loss was rated seven (7) and the greatest vulnerability to flood loss was thirty-three (33). Seneca and two other counties (Franklin and St. Lawrence) had ratings of seven (7), indicating they are the three of 58 NY counties with the least vulnerability to flooding. While each of the three are rural upstate counties with the same ranking, Franklin and St. Lawrence had slightly fewer NFIP claims than Seneca, their total dollar payouts for NFIP claims were less and their population densities are lower. Rankings for counties adjacent to Seneca were Cayuga (14), Ontario (13), Tompkins (19), Wayne (8) and Yates (9). What is clear is that flood events are frequent and losses can be significant in Seneca and other upstate counties, but the analysis demonstrates how density, development, demographics and infrastructure are key factors that increase a community's vulnerability to flooding. This rating or score does not represent the risk of flooding, since all counties have damaging floods, rather it shows how a greater density of population, infrastructure development and an increased number of properties in high risk flood zones increases vulnerability.

What does the above analysis mean for Seneca County?

It emphasizes that high density development in flood zones is the dominant factor influencing flood vulnerability, plus it highlights the vital roles that flood insurance, flood mitigation and management of development play in prevention and protection from flood losses.

* The 2011 SHMP data remains accurate and applicable, although it was not included or revised in the 2014 SHMP update.

Jurisdictions Most Threatened and Vulnerable to Flood Loss in New York

County	Rating	Total NFIP Policy Coverage	# of Repetitive Flood Loss Properties	# of Federal Flood Declarations	Population Density Per Square Mile
Nassau	33 Greatest Vulnerability	$ 11,519,673,100.	1,468	6	3,039
Seneca	7 Least Vulnerability	$ 25,276,600.	5	1	109

Source: NYS Hazard Mitigation Plan 2014, Table 3-19

Managing Flood Vulnerability and the National Flood Insurance Program (NFIP)

Based on National Flood Insurance Program (NFIP) statistics for 2011 to 2015, the average nationwide flood claim amounted to more than $46,000. There were 184,435 NFIP insured properties in New York State at the end of 2016, and it is estimated that only between 30% and 50% of at-risk properties are covered by flood insurance. Assuming that the number of current NFIP policies represents only about 50% of properties that should be insured, this means an additional 162,500 statewide properties could be at risk in the state's Special Flood Hazard Areas (A-Zones).* But looking at properties in the high hazard flood zones defines only a portion of the problem, since FEMA emphasizes that as many as 25% of the properties damaged by flooding are in lower risk flood zones outside the 100-year floodplain.

The term '100-year floodplain' is commonly mis-applied. It does not mean that a flood will occur every 100 years, rather it means there is a 1% chance a flood will occur in any year, and in the 100-year floodplain there is a 26% chance a property will be flooded over the period of a 30-year mortgage (more than once in 100 years), which FEMA notes is about five times higher than the risk for a severe fire.

* Source: NYS Hazard Mitigation Plan, 2014

While Seneca County has been included in only one (1) federal disaster declaration for flooding (Tropical Storm Agnes, 1972), the risk assessment and consensus among local officials demonstrate that flooding is the most frequent and damaging natural disaster in Seneca County. And because flood damage in Seneca County rarely qualifies for federal disaster aid, it underscores the importance of participation in NFIP to protect property owners and renters from flood losses.

The highest profile flood risk areas in Seneca County are those along the Cayuga-Seneca Canal and the lakeshore and outfalls leading to Cayuga and Seneca Lakes. The flood threat in Seneca County is amplified by the many creeks and drainageways that impact roads and properties throughout the county. In the north of Seneca County there can be slow rising and inundating flood conditions that last for days, while in the south of the county there can be hard-hitting flash floods where steep ravines drain to the lakes. In the north, spreading floodwaters can close roads, tear away drainage structures, prevent emergency access, destroy crops and leave standing water that damages homes.

In southern areas of the county, drenching sheets of rain can quickly overtake gullies and drainage paths, wash out roads and culverts and rip away foundations. In the villages and developed areas - where there are channeled creeks, catch basins and storm sewers – strong rains can swiftly overwhelm the capacity of these systems. Floodplains and flood risk also change over time as drainage and runoff patterns are unwittingly altered by development, or when debris and sediment build in channels, thus transforming area hydrology and flood threats.

National Flood Insurance Program (NFIP)

The extent of participation in the NFIP can be a significant factor in a community's vulnerability to flooding and its capability to recover from flood losses.

When a mortgage or loan is obtained for an improved property located in a Zone A 100-year flood zone, most lenders will require that the property owner purchase and maintain flood insurance. Anytime a mortgage or loan is obtained from a federally regulated institution that involves a property in the high-hazard flood zone, federal law requires the property owner to purchase and maintain flood insurance -- this includes most types of mortgages, home equity loans and lending where the property is used as collateral. If a property is not covered by flood insurance and it is damaged by a flood, and federal disaster assistance is obtained, the property owner will be required to purchase and maintain flood insurance as a condition of receiving flood damage reimbursement.

Not all flood events will meet the federal criteria needed to make federal disaster aid available to help with losses; flood insurance may often be the only way a property owner can recover flood damages. It is FEMA's goal that all properties in the high-hazard flood zone be covered by flood insurance and they recommend that property owners in moderate and low risk areas also purchase flood insurance – policy costs for those in moderate and lower risk areas outside the A-Zone are significantly less – renters can also purchase flood insurance.

Residential Properties in High Risk Flood Zones			
County	# of Residential Properties in A-Zones	# of NFIP Policies in A-Zones	Percent of A-Zone Properties Insured By NFIP
Seneca	**506**	**169**	**33%**
Cayuga	1,355	518	38%
Onondaga	2,503	1,902	54% *
Ontario	1,098	664	60% *
Schuyler	290	78	27%
Steuben	2,164	978	45% *
Tompkins	456	376	82% *
Wayne	1,084	270	25%
Yates	794	300	38%

Source: NFIP, 2017

* Counties with a higher percent of insured A-Zone properties are typically those with greater flood vulnerability, but they may have local programs that encourage or promote NFIP coverage, and they might have an increased number of renters with coverage which can result in two or more policies for a single property.

Estimating Potential Losses from Flooding

Using HAZUS-MH, 2.1, a FEMA methodology for estimating potential losses from disasters, the NYS Hazard Mitigation Plan (2014), Table 3.9m estimates the average annual flood loss for Seneca County is $39,764. The average for Seneca and its six adjoining counties is $167,300, with Cayuga the highest at $613,634 and the lowest is Yates at $30,690. The statewide average is $467,736, where Ulster County is the highest at $9,725,269.

The HAZUS analysis in the 2014 NYS Hazard Mitigation Plan, Table 3.9n models a 100-year flood event that estimates potential losses and damages that Seneca County could experience, as outlined in this table. The 2014 State analysis was determined to be accurate and credible and no changes have occurred that warrant a re-analysis in 2018. The State data is particularly valuable because it compares Seneca's position relative to nearby County's which helps define the scope of potential losses for Seneca County.

Estimate of Potential Flood Losses for Seneca County 100-Year Flood Event	
Building Related Economic Loss	$ 10,800,000
Building Related Business Loss	$ 20,000
Building Economic Loss as % of Exposure	0.45%
Debris (in Tons)	1,749
Shelter Requirements	62
Fire Stations (substantial damage)	0
Police Stations (substantial damage)	0
Schools (substantial damage)	0

The NFIP produces digital flood maps and when used with Geographic Information System (GIS) analysis these methodologies can evaluate the risk of flooding in a community's high risk flood zones. As noted previously, however, flood damage can occur outside the 100-year floodplains where the flood risk is considered lower.

The following table outlines potential flood damages relative to all residential properties in each community, thus providing a means to estimate overall flood impacts across an entire jurisdiction. It estimates the value of residential property that could be impacted by a flood that damages 1% of the properties in each jurisdiction. A flood that damages 1% of properties was chosen because it represents the scope of damages often seen in actual flood events occurring in upstate communities with a flood profile similar to Seneca County (see the examples under *Evaluating Severe Flood Vulnerabilities* on the next page). Estimates using a higher percentage of damaged properties can be applied for floods of greater scope, and in other counties or regions vulnerabilities will be greater where they have high density development, exposure to coastal storms and/or steep terrain.

Potential Costs of Flood Damage to Residential Properties			
Jurisdiction	**Number of Residential Properties**	**Total Residential Property Value**	**1 % of Properties Damaged / Potential Value of Damage**
Covert, T Interlaken, V	1,017	$ 152,793,415	10 $ 1.5 million
Fayette, T	1,514	$ 196,868,170	15 $ 2.0 million
Junius, T	479	$ 38,490,000	5 $ 385,000
Lodi, T Lodi, V	730	$ 85,213,100	7 $ 860,000
Ovid, T Ovid, V	891	$ 110,062,500	9 $ 1.1 million
Romulus, T	790	$ 116,643,600	8 $ 1.2 million
Seneca Falls, T	2,946	$ 270,405,000	29 $ 2.7 million
Tyre, T	329	$ 25,807,000	3 $ 260,000
Varick, T	707	$ 122,101,400	7 $1.2 million
Waterloo, T Waterloo, V	2,409	$ 181,768,000	24 $ 1.8 million
County Total	11,812	$ 1,349,700,000	118 $ 13,005,000

Source: NYS Office of Real Property Tax Services, Municipal Profiles, 2015

Note: Property assessment administration and reports for villages are consolidated with the respective township

The estimates above assume that 1% of properties are significantly damaged to the extent the loss equals 1% of the value of all residential properties in these communities, or it could be viewed that dozens or hundreds of residences have medium or minor damage where the total loss matches 1% of residential values.

The estimated losses above may dramatically exceed actual losses experienced by communities in Seneca County in past flood events, but they highlight the extent of losses that can or have occurred in other rural, small-town communities in upstate New York. The following section outlines how other communities in New York with demographic and flood profiles similar to that of Seneca County have sustained severe losses of the magnitude outlined above.

Evaluating Severe Flood Vulnerabilities

Municipal flood recovery costs vary widely depending on the scope of the flooding, the extent and types of facilities damaged, the community's demographic features, density of development and property values. Based on data from the New York State Office of Emergency Management for recent floods, costs to local jurisdictions in rural upstate communities typically range from several thousand dollars to more than $16 million. In the August 2009 flood in Cattaraugus County, expenses in the Village of Gowanda (population: 2,600) amounted to $16.6 million, and in the Town of Perrysburg (population: 1,771) the cost was $5.2 million. In addition to clean-up costs and road repair, both these areas had extensive damage to municipal water systems, bridges, schools and hospitals. Costs in the Village of Perrysburg (population: 408) were $2 million, and in Yorkshire (population: 4,210) and East Otto (population: 1,105) they were $1.2 million each.

Aside from direct flood costs to municipal governments, severe flooding is particularly devastating to homeowners and businesses. In 2009, flooding in Chautauqua, Cattaraugus and southern Erie counties affected several rural villages and small towns. In the Chautauqua County Village of Silver Creek and four nearby towns, 43 homes were destroyed and 325 damaged. In the Village of Gowanda that borders Cattaraugus and Erie counties, one-third of the village's 1000 homes were damaged in the same flood.

Factors that affect the severity of flooding in these areas differ from that of Seneca County, just as there are similarities. The core of Seneca County's flood vulnerability is associated with populated and developed areas near the Cayuga-Seneca River and along the shore and tributaries leading to Cayuga and Seneca Lakes. But an intense, slow moving thunderstorm that stalls over northern and central portions of Seneca County could release several inches of rain in a short time that can inundate local drainage and cause extensive property damage. While the history and lower probability of damaging floods seem to offer a measure of relief for many Seneca citizens and property owners, serious risks and vulnerabilities exist for every community in upstate New York.

When federal public assistance is authorized to aid local governments, the federal portion of flood restoration costs are usually 75%, and the state typically reimburses 12 ½ %, leaving a 12 ½ % share to be borne by local governments. After any flood, local governments may still incur thousands or millions of dollars in disaster losses. And many less severe floods may not even meet the criteria needed to trigger state and federal assistance, leaving the county and municipal governments exposed to significant disaster expenses.

Flood prevention and mitigation measures play a significant role in reducing a community's exposure to unexpected and overwhelming costs associated with major disasters. Many communities in New York have been forced to take extraordinary measures when expenses after a severe flood have disrupted the economic stability and balance sheets of municipal finances. Recovery from damaging floods has forced small and large communities to unexpectedly seek costly loans and bonding, and they often must put-off or re-prioritize important community improvements and maintenance in order to divert funding for flood repairs. There are even situations where local governments had little choice but to raise taxes to cover flood losses.

Just as fire protection has benefited from decades of improvements and advances that significantly reduced losses associated with severe fires, the same emphasis on prevention delivers dramatic savings when applied to flood risks. Strong building codes for fire prevention, the widening use of smoke detectors and sprinklers and development of fire resistant building materials represent fire mitigation actions that have made a huge impact on reducing private and public losses from fires. Strengthened building codes in floodplains, managing development in a way that recognizes flood risks and infrastructure improvements that prevent or resist flood damage are very cost-effective mitigation goals for any community.

An example of such forward-thinking measures to prevent flood losses was undertaken in the Town of Newfane in Niagara County, a community of 9,000 on Lake Ontario that has flat terrain and a low flood-threat profile similar to much of Seneca County. Newfane's Wastewater Treatment plant was temporarily disabled by a flood in 1998 when the facility's electronic controls located on the ground floor became submerged in flood water, causing hundreds of thousands of dollars in damage. With help from the FEMA Hazard Mitigation Grant Program, the Town was able to complete a project relocating the plant's electronic systems to a level above the floodplain and redesign drainage profiles around the facility, thus eliminating future flood losses.

In Schoharie County, the small rural Town of Richmondville used FEMA Hazard Mitigation funding to redesign road and culvert drainage in a successful project that eliminated repetitive and costly flood damage. The following press release from FEMA highlights Richmondville's actions to reduce recurring flood losses and costs.

FEMA Approves $82,000 Project to Mitigate Flood Damage in Richmondville

Repairs to Franzen Road in the Town of Richmondville, NY, damaged during the June 2006 flooding were designed to a higher standard, and may be less vulnerable to future flooding.

Thanks to a FEMA program that funds flood mitigation improvements "We have a temporary conduit drain pipe there now," says Highway Superintendent Keith Alheiser, "but we need to get started with the bigger new culvert. The new one will solve a couple of problems: the volume problem, and the internal water routing problem. This one will be straight through."

A major FEMA goal is to mitigate, where it is cost effective, when restoring damaged infrastructure so the repaired facility is better able to withstand future disaster damages. Extra money spent now can reduce future impacts and costs.

FEMA's Marianne Jackson said "These kinds of mitigation activities are a smart way of spending money now to lessen future threats. This is an excellent example of an investment that will pay dividends for years to come".

continue to the next page

Structural losses associated with winter storms are most often related to damages caused by wind, heavy snow loads, water damage and freezing pipes. Communities also experience extraordinary expenses for health and emergency services, snow removal and debris disposal; and there are significant economic impacts resulting from power outages, or when transportation is disrupted and schools and businesses are closed.

In 2015, the Insurance Information Institute reported that the average homeowners claim for wind damage was $3,500, and if the claim included water and freezing damage, the average increased to $5,100. This table applies these averages to estimate potential storm losses.

Estimate of Severe Storm Losses to Residential Property

Jurisdiction	Properties at Risk	Potential Loss if 10% of property owners have $3,500 each in damages	Potential Loss if 10% of property owners have $5,100 each in damages
Covert, T Interlaken, V	1,336	$ 467,600	$ 681,360
Fayette, T	2,237	782,950	1,140,870
Junius, T	753	263,550	384,030
Lodi, T Lodi, V	1026	359,100	523,260
Ovid, T Ovid, V	1,225	428,750	624,750
Romulus, T	1,070	374,500	545,700
Seneca Falls, T	3,492	1,222,200	1,780,920
Tyre, T	622	217,700	317,220
Varick, T	981	343,350	500,310
Waterloo, T Waterloo, V	2,853	998,550	1,455,030
County Totals	15,595	$ 5,458,000	$ 7,942,600

Structures built in compliance with NYS building codes would be designed to withstand expected snow loads, so those at greatest risk are older non-compliant structures. While local communities have applied building codes for decades, the New York State Uniform Fire Prevention and Building Code went into effect in 1984 to apply statewide standards. Structures built prior to 1984 are sometimes thought to be at the greatest risk, but in rural farm communities of upstate New York, only a portion of those built prior to 1984 can be considered at higher risk, since the quality of early building techniques and materials make many older structures as strong or more stable than those built using today's standards.

A severe winter storm in Buffalo and Erie County, NY in 2001 accumulated seven (7) feet of heavy snow over five (5) days and there were twenty-two (22) structures with collapsed roofs, some totally destroyed and others with partial damage. There was also widespread damage to carports, porch roofs and accessory structures, which are often not reinforced as strongly as residential or commercial construction. The National Weather Service notes the maximum record snowfall in Seneca County was eighteen (18) inches or less than two (2) feet; and structural densities are also much less in Seneca County than in Buffalo and Erie. The U.S. Census Bureau estimated the 2015 median home value in Seneca County is $88,900, so if one-half the jurisdictions in Seneca County (7) were exposed to a heavy snow-load storm that destroyed half as many residences as occurred in Erie County (11 homes), the potential cost could be about $1.0 million across Seneca County or an average of $143,800 in each of seven affected (7) jurisdictions.

Tornado

The most destructive tornado in Seneca County was an F1 in June 2007 in the Town of Ovid. Damage was minor and totaled about $10,000 to a garage, utility structures and for debris cleanup.

Elsewhere in rural upstate New York, an F1 tornado in Corfu, Genesee County in 2009 resulted in power outages, damage to thirty (30) homes, two (2) businesses, a farm and barn, and several vehicles. Property damage, clean up and municipal costs in two affected municipalities totaled $2 million, although the greatest impacts and costs were in the Village of Corfu.

One of the most serious tornados in New York State was the 1998 F3 tornado in Mechanicville, Saratoga County. It resulted in $60 million in property damage across nine towns and villages. There were seventy (70) injuries, fifty-five (55) homes were destroyed and 280 homes and businesses were damaged. Several farms were damaged and twenty-five (25) cows were lost when a barn collapsed. Local governments incurred emergency service and debris cleanup costs that ranged from a few thousand to more than $1 million.

The communities across New York that were affected by these tornados are similar in size and profile, and also have the same risk of tornado occurrence, as jurisdictions in Seneca County. Potential tornado losses to communities in Seneca County could mirror these events if a similar tornado and circumstances were to occur locally. Since tornados tend to concentrate damages in defined areas or paths where they touchdown or pass, villages and towns that have population centers or areas of greater structural density have an increased potential for loss.

All structures in Seneca County are at risk of tornado damage, although only certain areas would be affected by any single tornado or event. The U.S. Census Bureau estimated the 2011 median home value in Seneca County was $88,900. If any jurisdiction in Seneca County sustained tornado losses similar to the 1998 F3 tornado in Mechanicville, Saratoga County, and 55 homes were destroyed, the potential loss to property in that town or village could approach $5.0 million. And, if an additional 280 homes had 20 % damage, the loss total could double to $10.0 million.

Ice Storm

An ice storm can result in property and infrastructure damage, particularly when there are downed trees and limbs, or when problems associated with lack of power and heat contribute to equipment failure, water damage and structure fires. The most significant costs of ice storms are usually the economic impacts linked to power outages, utility restoration and the disruption of transportation that affects commerce and closes businesses and schools. Costs of debris clean-up, emergency power, spoiled food, sheltering and emergency services are also significant. Two of the most costly natural disasters in New York were the 1991 ice storm in Rochester and portions of the Finger Lakes and the 1998 North Country ice storm.

In 2015, the Insurance Information Institute reported that the average homeowners claim for wind damage was $3,500, and if the claim included water and freezing damage, the average increased to $5,100. Potential losses for wind and water damage associated with an ice storm would be similar to that estimated in the section above for Severe Storms - see the previous table above ‘Estimate of Severe Storm Losses to Residential Property’.

The potential costs of a prolonged power outage following a severe ice storm would be similar to the losses estimated for power outages that can occur from many other hazards and are estimated below in the section ‘Utility Failure / Power Outages’.

The most significant costs to local governments in an ice storm are related to debris clearance and disposal, emergency services, sheltering and temporary emergency power. Data provided by the New York State Emergency Management Office shows that disposal costs for rural local governments affected by a declared disaster that involve significant amounts of downed debris can typically range from a few thousand to $150,000.

The NYS Hazard Mitigation Plan (2011)*[1] prepared a statewide assessment that evaluates and ranks county vulnerability to ice storms. A rating score is derived by combining an evaluation of the number of ice storm disasters that occurred in a county, the population density per square mile in the county and the total number of structures in the county. Seneca County has had only one major ice storm event, plus the population and structural densities are low, but since there is a history of serious ice storms in the region, the ice storm rating for Seneca County's is four (4); on a scale of 1 (least vulnerable) to 9 (most vulnerable). Seneca was among twelve (12) counties in the state that had a vulnerability of four (4). Twenty-Five (25) counties were ranked more vulnerable to ice storms and nineteen (19) counties were determined to be less vulnerable.

Jurisdictions Most Threatened and Vulnerable to Ice Storm Loss in New York

County	Rating Score	# of Ice Storm disasters	Total # of Structures
Seneca	4	1	11,423

*[1] NYS Hazard Mitigation Plan 2011 (SHMP Table 3-37). This data was not included or updated in the 2014 SHMP update, but the analysis from the 2011 plan remains valid.

The economic and demographic profiles of the northern New York counties are similar to that of Seneca County and the 1998 North Country Ice Storm resulted in power outages for 320,000 people in seven counties, requiring disaster assistance payments totaling $55,950,736, or an average loss of about $175. per person*[2] If one-third the population of Seneca County (2015: 34,833) were similarly affected, the estimated loss in Seneca County would be over $2.0 million.

*[2] Source: NYS Office of Emergency Management report

Severe Storms

For severe storm wind damage, see *Severe Winter Storms*, for flooding associated with severe storms, see *Flooding*.

Dam Failure

For dam failure vulnerability, see *Flooding*

Hurricane and Tropical Storm

For estimates of hurricane and tropical storm losses, see sections for Severe Storms and Flooding. Once a hurricane moves inland into upstate New York and Seneca County, they are characterized by high winds and/or flooding and lack the storm surge features that threaten coastal communities.

Transportation Accidents

Property damage associated with transportation accidents typically has a local orientation or is concentrated at an accident site and costs are commonly born by the responsible party or insurer. The most significant impact of transportation accidents is the potential for multiple deaths and injuries and the costs of emergency response, medical care, security and investigative services.

Highway

Given the traffic and transportation profile of Seneca County, the greatest potential for a serious accident is associated with school and tour bus transportation, where vehicles carry up to fifty (50) passengers, or a multi-vehicle chain reaction pile-up on the interstate highway involving weather and poor visibility. Response to an accident of this type could cost the local community and response agencies thousands of dollars, and would be a demanding organizational and emotional challenge, but much of the cost would be spread across several mutual-aid departments and services, and it can be expected that some costs would be recovered through responsible parties and insurers. For local governments and agencies, there may also be potential costs associated with liability claims, but only if it is determined that local infrastructure, facilities or maintenance were contributing factors.

Aircraft

The airport in Seneca County serves small aircraft that carry only a few passengers, and the low density structural profile of Seneca County limits off-airport impacts if a crash were to occur. Hazards associated with commercial air traffic using regional facilities in neighboring counties are considered extremely remote.

A rare and unlikely, but credible worst-case transportation threat would be a commercial airplane accident similar to the 2009 Colgan air crash in the small town of Clarence Center near Buffalo, New York where there were fifty (50) casualties. Another example would be an event similar to the hijacked 9-11, United Flight 93 that crashed in rural Pennsylvania killing forty-four (44). The 2009 Colgan disaster destroyed two homes and the 9-11 Flight 93 crash occurred in a remote farm and mining area. In the Colgan air crash, the Town of Clarence and local response agencies submitted claims to the airline for reimbursement of $1.2 million in costs, while Erie County sought reimbursement of $750,000. Major costs involved recovery of victims and remains, security, medical examiner and autopsy expenses, firefighting, safety measures and monitoring, equipment rental, repairs to streets and sidewalks and incident management.[1]

Rail

The Finger Lakes Railway (FLR) traverses Seneca County through Seneca Falls, Waterloo and to Geneva with a spur south to the Seneca Depot. The FLR is a privately owned short line railroad that provides commercial shipping of metals, papers, canned goods, sand, chemicals, salt, grain, fertilizers, plastic, corn syrup, clay, soda ash, lumber and building materials. While no major rail accidents have occurred in Seneca County, the physical damages and impacts associated with a rail accident, particularly one involving hazardous materials could be severe. The threat is greater in more densely populated village and residential areas that border the rail line. There are generally few mass-casualty incidents associated with freight train accidents, unless hazardous materials or other multi-passenger vehicles are involved.

A 2011 train accident occurred in a residential neighborhood of Rochester, NY when seven (7) cars of a forty-two (42) car train derailed and two of the cars were carrying hazardous materials. Thousands of gallons of the chemicals methylene chloride and acetone were spilled and caught fire and the derailed cars severely damaged two homes. There was only one injury to a rail employee, but neighboring homes were evacuated for several hours. Emergency services were involved in the response into the following day; railway crews and emergency contractors worked for several days to contain, reclaim and clean-up the chemicals and to remove the rail cars. Costs were primarily born and reimbursed by the rail company and their insurer.[1]

The statewide CSX/Amtrak line is to the north outside Seneca County, but if a major accident were to occur on this line, extensive emergency assistance would be dispatched from Seneca County to provide mutual aid.

Map Source: Finger Lakes Railway

[1] Source: NYS Emergency Management Office reports

Oil Spill

There are 196 sites throughout Seneca County that have NYDEC petroleum bulk storage permits; where they primarily transport, transfer and/or store gasoline, fuel oil and related petroleum products. In the years 2014, 2015 and 2016, there was an average of forty-six (46) oil spills in Seneca County in each of those three (3) years. The spills commonly involve small quantities of vehicle related fuels and oils at accident sites or at vehicle maintenance facilities where filling and transfer occur. Most spills are minor and are remediated quickly and costs are commonly covered by the property owner, facility operator or transportation company that is responsible for the spilled product. NYSDEC notes that a spill of 50 to 300 gallons can cost from $2,000 to $10,000 in cleanup and remediation, but the cost can be as much as $50,000 if groundwater and other factors complicate the response. In Schoharie County several years ago, an oil spill at their County Office Building disrupted government operations for days and the cleanup cost exceeded $150,000. There can also be emergency response costs to local governments and fire departments, which are sometimes reimbursed by the party responsible for the spill, or costs may be minimal and are considered a common and regular expense of emergency response operations.

A large or more widespread oil spill could result in major costs for environmental protection and clean up. Damage to homes or improved property might not be a factor, but a spill that seriously impacts groundwater, public water supplies, or a severe spill affecting recreational waterways could pose significant costs for businesses, the local economy and tourism. Local governments in Seneca County do not have the resources and could not absorb the costs associated with a major oil spill. Action by the responsible party or support from state and/federal agencies would be essential to response and recovery from any serious spill.

Source: NYS DEC Spill Incident and Bulk Storage Databases

Hazardous Materials – In Transit

Highway and Rail

Risks and costs associated with hazardous materials transportation accidents are potentially highest in the area of Seneca Falls, the Town and Village of Waterloo and the northern towns of Tyre and Junius that border Interstate 90 and the access roads to I-90. Potential risks exist on any of the State highways in Seneca County; including Routes 5&20, 318, 96, 96A and 414 and any route providing access to facilities using hazardous materials. In Seneca County, one Major Oil Storage Facility (MOSF) and 16 Chemical Bulk Storage (CBS) facilities - where regulated types and amounts of hazardous chemicals are used, stored and/or transported - maintain permits with NYSDEC. Five facilities in Seneca County are subject to reporting requirements under the federal Emergency Planning and Community Right-to-Know Act (EPCRA) Title III, which means they report and/or participate in preparedness measures for hazardous chemicals that are used or processed at their sites.

Seneca County EPCRA Title III Reporting Facilities

Sceptor New York	ITT Goulds Pumps
Frazier Industrial	Griffith Energy - Lodi
Evans Chemetics	

EPCRA Title III requires that spills of certain hazardous chemicals above threshold quantities be reported to the National Response Center (NRC). For the three year period 2014-2016 there were two (2) hazardous material releases or spills in Seneca County that were reported to the National Response Center (NRC). No data or comments in the reports indicated that a serious threat or emergency response occurred

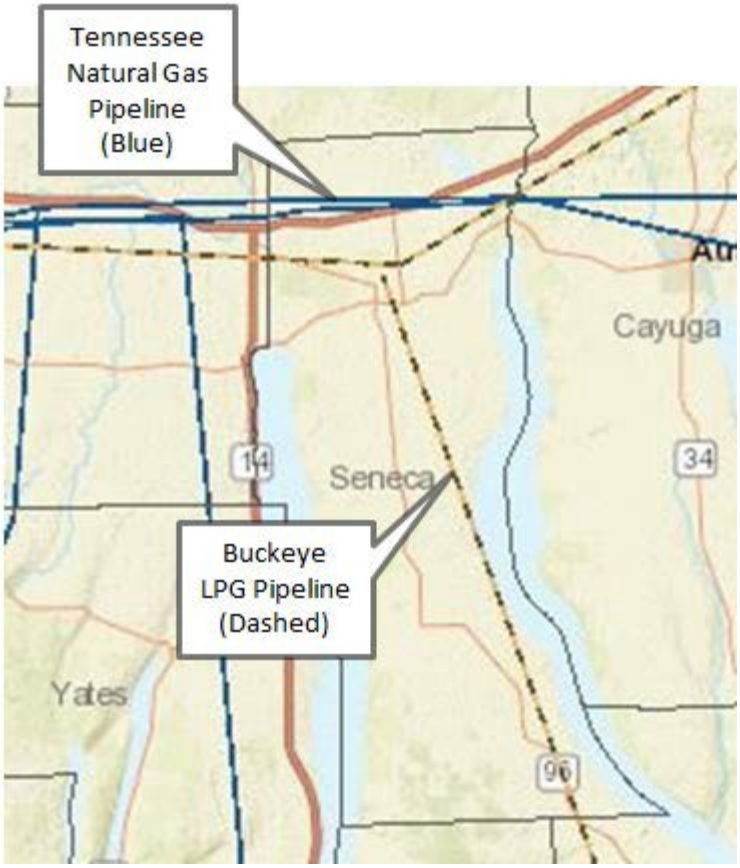
Historically, hazardous material incident costs have not been a significant burden for local governments in Seneca County, but the potential for serious threats exist that could impact public health, damage homes, improved property and infrastructure. In the previous section on oil spills, it was noted that cleanup and remediation costs can exceed $150,000, and it could be expected that a serious spill or release involving hazardous chemicals could run into the millions of dollars. Cleanup and remediation of chemical hazards would typically be borne by a responsible party or covered through an environmental protection fund, but local governments cannot always be assured that emergency response costs or the cost of restoring public infrastructure will be reimbursed. The Firefighters Association of New York (FASNY) has asked the NYS Legislature to budget up to $10,000 for reimbursement to volunteer fire departments involved in a hazardous materials response. The American Red Cross (ARC) estimates that community shelter or temporary housing costs can be as much as $100 per day/per-person, so if a hazardous materials evacuation zone covered a 1-mile radius in or near a village area involving 100 people, community expenses could quickly approach or exceed $20,000 in 2-3 days.

Energy Pipelines

For emergency planning and hazard mitigation purposes, energy pipelines are defined or grouped as a transportation hazard. Two energy pipelines, one natural gas and one liquefied petroleum gas, traverse Seneca County. Gas pipelines are primarily underground but may be exposed on the surface at certain locations; and there are generally terminals, valves, vents, signs and other above ground or visible features. The natural gas industry is subject to regulatory safety requirements and applies extensive technologies to prevent hazards, but gas pipeline disasters have historically been costly in both loss of life and property damage. The 1990 gas pipeline explosion in North Blenheim, Schoharie County killed two people and destroyed 10 homes.

Local governments can expect that costs associated with a pipeline hazard will be borne by the pipeline operator. Local hazard mitigation efforts generally center on using local laws and zoning to authorize and approve site plans for natural gas facilities. Working with pipeline operators on emergency planning is also an important local government role. In addition, local officials coordinate with state and federal regulators to enhance and monitor pipeline system maintenance and safety.

Energy Pipelines in Seneca County



Highways in Red
Source: US Energy Information Administration

Extreme Temperatures

Extreme temperatures are not expected to pose significant losses to improved property or infrastructure, where costs would primarily be associated with damaged water lines, frost heaving in concrete drives and roadways, plus fire damage linked to reduced or disrupted water supply. Costs associated with extreme temperatures would be more directly related to emergency services and health care for people at risk to extreme heat or cold; plus temporary warming or cooling centers, water treatment, supplemental water and/or fuel supplies and losses to the agricultural community.

The National Weather Service (NWS) reports that two extreme temperature events are recorded for Seneca County, one for heat in 2011 and for cold in 2000. No property losses were reported for Seneca County in these events, but in other counties that reported losses the maximum was about $3,000. A severe extreme temperature emergency affected twenty-one (21) New York counties in 2004, where there was an average of $10,500 in property damage losses across the 21 counties. The National Oceanographic and Atmospheric Administration (NOAA) estimated in 2005 that the average hospitalization costs to treat a victim of extreme heat or cold was $16,741 for a typical 3.5 days stay.

Landslide / Slope Failure

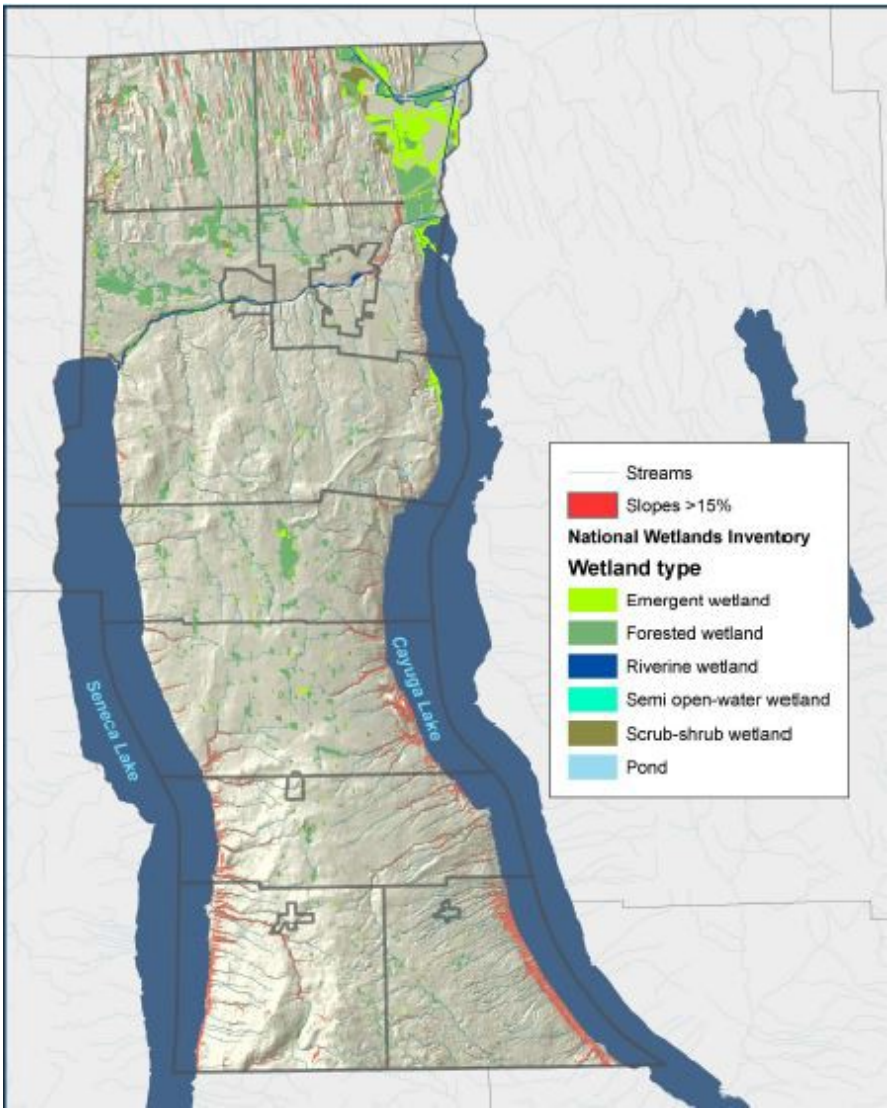
Landslides in Seneca County occur on the steep slopes of the four southern towns; Romulus, Covert, Ovid and Lodi. They are more commonly defined by local officials as a flood event because they occur when heavy rains overwhelm drainage channels on the steep slopes above Cayuga and Seneca Lakes. The area is sparsely populated, but drenching rains can result in slope failures and damage to roads, drainage culverts and water lines; and there can be devastating losses to properties and residences on the lakeshores at the base of these slopes. The United States Geological Survey (USGS) estimates that Seneca County has low landslide susceptibility, and the report does not record any landslide incidents – but as noted above, local landslide events and damage have historically been reported as flood losses.

The USGS notes that landslides are a natural phenomenon and that damage or impacts to residences and municipal infrastructure are linked to development or man-made modifications to the land. Landslides are commonly associated with heavy rain and runoff and affect very specific and localized sites, such as small sections of road or infrastructure, and usually only a few structures or properties. Landslides have not caused serious residential damage, but washouts can alter natural drainage, sections of local roads, culverts and related infrastructure. As highlighted by the Seneca County Soil and Water Conservation District (SWCD), steep slopes are defined as those where the slope exceeds 15% and they emphasize that construction on steep slopes increases the risk of landslides.

A landslide that damages a small and isolated section of roadway and associated infrastructure could result in repair costs up to about $100,000. Damage to a home or structure might cost up to $150,000 or more, depending on the value of the structure and extent of loss.

If long stretches of roadway are damaged and accompanying slope reinforcement or protective measures are needed, costs can be much higher. In 2009, Erie County, NY completed the restoration of 750 feet (less than football field) of a flood damaged rural roadway that included drainage and slope reinforcement. The cost was approximately $2 million, or about $14.1 million per mile.

Steep Slopes Highlighted by Red



Source: Seneca County Planning and Community Development

Utility Failure / Power Outage

Disruption of electrical service is the most common utility interruption and usually the result of severe storms, ice storms, high winds, equipment and technological failure, terrorist or criminal activity, fires and accidents. Natural gas service can be affected by supply disruptions, equipment or technical failure, terrorism or sabotage, fires and accidents. Communication services are also at risk to severe weather, storms, high winds, equipment or technical failure, terrorism or criminal activity, fires and accidents.

Damages and costs to improved property and municipal infrastructure associated with utility outages are most often related to surges that damage electrical services, equipment and appliances. Damaged equipment and structural impacts can also occur when heat and power loss cause freezing and water damage. Fires are a further concern when there are electrical malfunctions or gas leaks, and when alternate heating sources and generators are misused during outages.

While not directly affecting improved property and infrastructure, there are many other utility and power outage costs that impact the community. Spoiled food and its replacement cost, emergency response and sheltering, and health care costs linked to increased injuries and the loss of heat and air conditioning are common. The most costly impacts to the community from a sustained, widespread power outage can be economic and include the closing of businesses and schools, disruption of commerce, suspension of transportation and public services and unemployment. Agricultural operations also experience significant losses when there are utility failures.

The most power sensitive facilities and customers typically include:

- Mission-critical computer systems
- Industrial processing companies
- High-tech manufacturing facilities
- Financial institutions
- Digital communication facilities (wireless, television, satellite)
- Military operations
- Wastewater treatment facilities
- Hospitals and other health care facilities

Power outages or service interruptions impose direct costs on facilities and customers in the following ways:

- Damaged facility equipment
- Diminished or off-specification product and output
- Extra maintenance costs
- Cost for replacement or repair of failed components
- Loss of revenue due to downtime that cannot be made up
- Costs for idle labor
- Liability for safety and health

U.S. Environmental Protection Agency (EPA) data estimates electric power reliability and the associated costs that customers experience when there is an interruption of power (See: USEPA, *Calculating Reliability Benefits*, last updated, July 2009). Their analysis estimated the cost of outages per kilowatt hour for Pacific Gas and Electric (PG&E) customers.

Costs of Power Interruption

Customer Class	$/kWh un-served
Industrial	$12.70 - $424.80
Commercial	$40.60 - $68.20
Agricultural	$11.50 - $11.70
Residential	$5.10 - $8.50

Note: A kilowatt hour is a unit of energy equal to 1000 watt hours. A heater rated at 1000 watts (1 kilowatt), operating for one hour uses one kilowatt hour of energy. Using a 60 watt light bulb for one hour consumes 0.06 kilowatt hours of electricity, or using a 60 watt light bulb for one thousand hours consumes 60 kilowatt hours of electricity.

The U.S. Energy Information Administration (EIA) estimated in 2008 that residential customers in New York State used an average of 19.7 kilowatt hours of electricity per day. Using the EPA and EIA estimates, residential customers in Seneca County would have costs that range from $100 to $167 each day there is an outage. If electric service is disrupted throughout an entire town or village, the table below uses this cost range (at $133) to estimate daily residential losses in each town.

Power Outage - Daily Household and Community Costs

Potential Residential Power Outage Costs Per Day			
Jurisdiction	**Occupied Residences[1]**	**Average Cost Per Day**	**Total Daily Cost Per Jurisdiction**
Covert, T	987		$ 131,270
Fayette, T	1,529		203,360
Interlaken, V	273		36,300
Junius, T	526		69,960
Lodi, T	705		93,760
Lodi, V	176		23,400
Ovid, T	921		122,500
Ovid, V	267	$133	35,500
Romulus, T	826		110,000
Seneca Falls, T	3,874		116,300
Tyre, T	395		52,500
Varick, T	660		87,800
Waterloo, T	1,955		265,300
Waterloo, V	3,138		417,350

[1] U.S. Census, 2015

Analysis of Key Hazard Vulnerabilities

For many types of hazards, vulnerabilities are similar or uniform for all jurisdictions in the County, while other hazards pose unique vulnerabilities for certain jurisdictions. Vulnerability identifies or evaluates the kinds of problems and impacts associated with a hazard; such as how special populations can be affected, the type and extent services that are disrupted and dangerous conditions that are likely.

-- Specific sites, locations and facilities are noted in the preceding pages of this section --

Jurisdiction	**Floods**	**Severe Storms**	**Winter Storms**	**Tornado**	**Transportation**	**Oil Spills, Hazardous Materials and Pipelines**	**Extreme Temps**	**Utility Failure**	**Steep Slopes**
	Vulnerabilities for the hazards checked below exist in all Towns and Villages								
All	✓	✓	✓	✓	✓	✓	✓	✓	
	Those with checks below have unique vulnerabilities described following this table								
Covert, T	✓					✓			✓
Fayette, T	✓					✓			✓
Interlaken, V	✓								
Junius, T	✓		✓		✓	✓			
Lodi, T	✓								✓
Lodi, V	✓								
Ovid, T	✓					✓			✓
Ovid, V	✓								
Romulus, T	✓					✓			✓
Seneca Falls, T	✓		✓	✓		✓		✓	
Tyre, T	✓		✓		✓	✓			
Varick, T	✓					✓			
Waterloo, T	✓		✓	✓		✓		✓	
Waterloo, V	✓		✓	✓		✓		✓	

Floods

All areas of Seneca County have vulnerabilities associated with flooding, many related to blocked or inadequate drainage and inadequate size or capacity of channels, culverts and other systems designed to manage drainage. Most jurisdictions also have flood vulnerabilities linked to one or more of the following flood threats.

Vulnerabilities for all areas of the County include

Densely populated neighborhoods, subdivisions and residential tracts
Structures and residences near streams, creeks, rivers and natural retention areas
Damage to roads, bridges, culverts and drainage systems
Public infrastructure; water, sewer, communications
Emergency services and access
Business and service disruptions
Food, fuel and inventory management disruptions
Closed roads and dangerous travel conditions
Threats to medical and institutional populations
Secondary hazards such as fires and hazardous materials
Power and communications disruptions
Damage to automobiles and accessory structures

Unique local vulnerabilities

- Flooding of the Seneca River
- Lakeshore flooding
- Flooding related to inadequate design and/or flow capacity at roads, culverts, bridges and municipal infrastructure
- Flooding associated with construction and/or design of buildings, structures and development (subdivisions, parking lots, commercial and industrial structures, railways and dams). In most situations, any development will impact drainage and water management, but too often the project itself or inadequate design contributes to or worsens flood vulnerabilities.
- Flooding related to man-made alteration of natural drainage areas that reduce water retention and spillway capacity; usually linked to development, agricultural practices and man-made removal or reduction of capacity in natural drainage basins.

Severe Winter Storms

Densely populated areas that rely on complex transportation networks typically have a greater vulnerability to winter storms when highway, public transportation and other infrastructure are disrupted. In Seneca County's rural towns and small villages, closed roads and disrupted services pose serious vulnerabilities, but communities in Seneca County have options and flexibility that allow them to recover quickly.

Vulnerabilities for all areas of the County include

Travel and access restrictions
Traffic hazards/injuries
Power outages
Business and service disruptions
Food, fuel and inventory management disruptions
Fires and Carbon Monoxide exposures linked to alternate heat sources
Roof and structure damage
Increased demand for emergency medical services due to heart and health risks

Unique local vulnerabilities

Town of Seneca Falls, Town and Village of Waterloo
Densely populated neighborhoods may be slightly more vulnerable than rural areas of the county because snow must be moved and/or hauled to open narrow streets and there is limited open space for disposal. Higher volume traffic and truck routing on State Rouses 5 & 20 may also pose increased travel vulnerabilities.

Towns of Junius and Tyre
Winter storm closings, detours and travel disruptions on the NYS Thruway (I-90) result in greater traffic management, emergency response and demands for traveler services in these towns.

Tornado

The risk of a damaging tornado is about the same for all areas of Seneca County, but tornado vulnerability is greater in more densely developed and populated communities where greater numbers of property and people can be impacted.

Vulnerabilities for all areas of the County include

Travel and access restrictions
Structural damage
Downed trees and debris impacting travel and safety
Road and infrastructure damage
Increased demand for emergency medical services
Sustained and disrupting power outages
Business and service disruptions

Unique local vulnerabilities

Town of Seneca Falls, Town and Village of Waterloo

Densely populated areas are at greater vulnerability because tornados cause devastating destruction along concentrated storm paths, resulting in severe damage and injuries when they strike in developed and populated areas.

Ice Storms

Ice storms can impact all of Seneca County, but vulnerability is reduced in rural communities where residents are self-reliant and less dependent on public services for transportation and utilities. Many in Seneca County have alternate fuels, they tend to look-in on neighbors needing help and they support community services like volunteer fire departments that provide disaster services.

Vulnerabilities for all areas of the County include …

Downed trees and debris impacting travel and safety
Exposed electrical hazards
Widespread and prolonged power outages
Disruption of business and community services
Fires associated with alternate heat sources
Heating system disruption impacting vulnerable populations
Limited availability of generators

Unique local vulnerabilities

Electrical service is the predominant public utility impacted by ice storms and thus poses vulnerabilities for all areas of the county. There may be a slightly increased vulnerability for village and populated areas where fewer residents have alternate heat and power sources and there can be a greater concentration of storm debris. In other ways though, rural areas are uniquely vulnerable because it can take longer to restore power in remote and sparsely populated areas.

Oil Spills, Hazardous Materials and Energy Pipelines

Vulnerabilities associated with oil spills and hazardous material releases are generally linked to sites where these materials are processed and transferred; such as refinery or production facilities, industrial operations and fueling stations. There are also vulnerabilities created by transport and accidents involving these materials on highways across Seneca County. Energy pipelines also create vulnerabilities for adjacent people and properties.

Vulnerabilities for all areas of the County include …

All communities are exposed to vulnerabilities associated with the transportation of oil and hazardous substances on state and local highways, and all have retail or private fuel services that pose vulnerabilities.

Unique local vulnerabilities

The **Towns of Junius and Tyre** have greater vulnerability associated with the transport of materials on the NY Thruway (I-90) and in the **Town of Tyre** there is increased commercial traffic and fuel operations in the I-90/Rt. 414/Rt. 318 area. In other ways though, vulnerability is reduced for these two towns because of their low-density populations.

The **Town of Seneca Falls and Town and Village of Waterloo** have increased vulnerability related to the density of their populations, commercial sites and industrial facilities along the State Routes 5 & 20 corridor.

The **Towns of Junius, Tyre, Waterloo, Seneca Falls, Fayette, Varick, Romulus, Ovid and Covert** host natural gas or petroleum (LPG) pipelines.

Transportation

Multiple passenger highway vehicles, tour and school buses are the principal transportation vulnerabilities for Seneca County.

Vulnerabilities for all areas of the County include

School transportation and an active regional tourism industry contribute to extensive bus and multiple passenger vehicle travel in the county that pose vulnerabilities for all communities.

Unique local vulnerabilities

The **Towns of Junius and Tyre** have increased exposure due to the volume of travel on the NYS Thruway (I-90).

Utility Failure / Power Outage

Power outages associated with utility failure have occurred regionally and statewide, but also can affect localities and individual facilities. All areas of the county are vulnerable to outages.

Vulnerabilities for all areas of the County include

Widespread and prolonged power outages
Disruption of business and community services
Fires and Carbon Monoxide exposure associated with alternate heat sources
Heat and HVAC interruption impacting vulnerable populations
Limited availability of generators
Food inventories and distribution
Fuel supply disruptions

Extreme Temperatures

Extreme hot or cold temperatures primarily affect vulnerable populations; particularly the aged, very young, the institutionalized, those with medical conditions and those with impaired mobility. Extreme temperatures increase demands for emergency services and the workload for medical care providers. Vulnerabilities exist in all areas of Seneca County.

Steep Slopes

Flood vulnerabilities, including shoreline lake flooding are described above. Steep slopes exist above both Cayuga and Seneca Lakes, particularly in southern areas of Seneca County where they present special vulnerability concerns for communities and property owners. In these areas, upland drainage and runoff are channeled into steeply falling streams and culverts that carry swift water down the slopes with great force and powerfully damaging impacts. During severe storms and when there is significant runoff, flash flooding can occur from the top of the slope to the lakeshore along these channels that run for ¼ mile or more. Damage can be severe to roads and bridges, infrastructure such as water and utility lines, sanitation systems, homes and properties. In some cases there are only single roads or drives leading to properties below and access to these areas can be severed by the damaging downslope flooding.

Unique local vulnerabilities

The **Towns of Covert, Fayette, Lodi, Ovid and Romulus** have vulnerabilities associated with flooding on steep lakeside slopes.

Severe Storms – see Flooding and Winter Storms

Dam Failure – see Flooding

G. Analysis of Development Trends

Development in Special Flood Hazard Areas

A priority flood mitigation objective listed in this plan for all Seneca County communities is to manage, and prevent where possible, development in Special Flood Hazard Areas (Zone A). This is achieved by enacting local development policies and laws and by enforcing the NYS Building Code and federal floodplain management regulations for all building and construction.

Local governments report there has been no recent development in Special Flood Hazard Areas and none is planned. Seneca County provides code enforcement services for most local jurisdictions and applies the NYS State standard building code and federal floodplain management regulations

1. Development Management

The primary planning documents and local authorities tasked with analyzing and managing development in Seneca County and its communities include the following.

County Boards and Departments	Mitigation Planning Role
Seneca County Board of Supervisors	County Board members are also Supervisors of the respective townships, which provides integrated leadership for development and mitigation planning
Seneca County Planning Board	The County Planning Board reviews local development proposals that have county-wide impacts and influence extending beyond local boundaries
Seneca County Planning and Community Development Department	Provides support to the County and local governments on comprehensive planning, floodplain management and grant opportunities
Seneca County Emergency Services	Provides support to the County and local governments regarding state and federal hazard mitigation programs and the development of public safety services

County Boards and Departments	Mitigation Planning Role
Seneca County Code Enforcement	Provides Code Enforcement and Building Inspection Services for most Seneca County towns and villages. Applies and enforces the NYS Uniform Fire Prevention and Building Code and NFIP Floodplain Management Regulations county-wide

2. Boards and Authorities Contributing to Planning and Development in Seneca County

Contributing Organizations	Local Mitigation Planning Role
Seneca County Soil and Water Conservation District (SWCD)	Assists the County and municipalities with eligible drainage, run-off management and soil conservation projects that can include technical support, grant preparation and funding
Seneca County Farm Bureau	The Bureau can coordinate local mitigation efforts with farmland owners. They are a resource to communities looking to partner with farmers on projects to manage farmland drainage
Genesee-Finger Lakes Regional Planning Council Central New York Regional Planning and Development Board	These regional planning organizations provide planning support to local governments, mostly in the form of regional data analysis, fact-gathering and setting integrated regional goals. Genesee-Finger Lakes coordinates programs for watershed protection involving Seneca Lake and the Central NY Board does the same for the Cayuga Lake watershed. The input and resources of these Boards are of significant influence for lakeshore communities in their management of lakeshore development and mitigation. The Boards also provide guidance and tools that aid with land use planning and economic development.

Contributing Organizations	Local Mitigation Planning Role
Seneca Lake Pure Waters Association Finger Lakes-Lake Ontario Water Protection Alliance (FL-LOWPA) Cayuga Lake Watershed Network	These citizen action and community interest organizations have significant influence on watershed planning and development in their respective regions. Local mitigation needs and actions are monitored by these groups and they often provide valuable input on watershed protection proposals and activities

3. Development Plans and Policies

County Plans and Policies	Local Mitigation Planning Role
Seneca County Comprehensive Plan, 2014 Seneca County Plans	This plan emphasizes the County's commitment to managed development, small business and employment growth, farmland protection and natural resources conservation. These county-wide goals are applied by communities to manage local development and determine mitigation strategies
Seneca County Housing Plan, 2011 Seneca County Plans	This plan addresses housing stock and quality for Seneca County. Not previously recognized as a mitigation tool, the mitigation planning process was used to demonstrate to local officials how natural hazards and mitigation can impact housing policies and choices in their communities
Seneca County Agriculture and Farmland Protection Plan, 2011 Seneca County Plans	Several communities identified mitigation goals related to drainage and runoff from farmland. This plan was recognized as a resource that will aid communities in working with agricultural operators on stormwater management
Seneca County Environmental Conservation Plan, 2014 Seneca County Plans	Many projects in this Hazard Mitigation plan are linked to drainage and stormwater management. The mitigation solutions and the problems they correct are closely tied to goals established in the Environmental Conservation Plan

County Plans and Policies	Local Mitigation Planning Role
Seneca County Economic Development Plan, 2014 Seneca County Plans	This plan outlines the County's emphasis on small business promotion, the importance of tourism and recreation, agriculture and modest employment growth. Communities in Seneca County are not expected to face significant development pressure, but there is increasing emphasis on smart growth that will preserve community character. Evaluation of hazard mitigation opportunities should be linked with this kind of growth

Regional Plans and Policies	Local Mitigation Planning Role
Finger Lakes Regional Sustainability Plan, 2013 Regional Sustainability Plan	A regional plan to create more sustainable communities by funding smart development practices. The goal is to implement projects that will significantly improve the economic and environmental health through integrated sustainable solutions. While not directly linked to hazard mitigation, the Mitigation planning team reviewed this and other development incentives with local officials to highlight the important relationship between managed development and mitigation practices
Seneca Lake Watershed Management Plan, 2013 Seneca Lake Plan	These plans establish a long-term strategy for the protection and restoration of water quality in each respective watershed. These goals are achieved by ensuring compatible land use and development in the communities that make up the watershed. When hazard mitigation reinforces and compliments watershed objectives, local mitigation projects will gain community support and potential funding
Cayuga Lake Watershed Management Plan, 2017 Cayuga Lake Plan	

Municipal Plans and Policies	Local Mitigation Planning Role
Town and Village Comprehensive Plans	8 of 10 Towns have comprehensive plans, 2 of 3 villages are part of their respective town plans. The plans focus on managed development, agricultural protection and natural resource conservation. All have sections addressing land use and stormwater management. These policies are well recognized and strongly supported priorities in the community that are regularly applied in local decision-making, including mitigation planning
Local Zoning, Site Plan Review and Subdivision Laws	The larger towns and villages have zoning regulations, 7 of 14 communities have Site Plan Reviews and 5 have Subdivision Regulations. In four of the most rural, sparsely populated communities there has not been the extent of development pressure needed to prompt enactment of these laws.
Local Engineering, Land Use and Special Project Studies	Communities must also consider any plans and studies prepared locally. For example, the Town of Tyre recently completed its Routes 414-318 Commercial Corridor Master-Plan Draft, 2017

Local Planning and Land-Use Resources

Small towns in Seneca County have few resources, no planning staff and small budgets – they rarely hire and produce engineering and planning products and usually only when outside funding is available. Even when producing or updating basic land-use tools like zoning ordinances, comprehensive plans and site plan review policies, they require state grants or related resources.

Communities with comprehensive plans and related land-use policies that support hazard mitigation are listed on the next page. But there are few local plans that provide engineering or technical analysis specific to mitigation improvements and proposals. Most of the local plans presented during the mitigation planning process were water supply system reports and others that were old and of little relevance. Rather than list them, a better example of a recent transportation study completed in the Town of Tyre was referenced above.

4. Local Development Policies

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Seneca County	X	X			X		
Covert (T)				X		X	
Fayette (T)		X	X		C	X	X
Interlaken (V)							
Junius (T)	X	X			X		X
Lodi (T)					X		X
Lodi (V)							
Ovid (T)	X	O		X			
Ovid (V)							
Romulus (T)	Z	X	X		X	X	
Seneca Falls (T)	Z	X	X			X	
Tyre (T)		X	X				
Varick (T)		X	X		C	X	
Waterloo (T)	Z	X	X			X	
Waterloo (V)	Z		X				

X Adopted
O Plan or Update in Development
Z Part of Zoning
C Part of Comprehensive Plan

Current: January 2018

Source: Seneca County Planning and Community Development

5. Population Trends

Population growth and associated development in Seneca County is not expected to significantly influence hazard mitigation goals and priorities in the years ahead. As noted by U.S. Census data for recent decades there have been only modest population gains and losses. Projections by the Genesee-Finger Lakes Regional Planning Council through 2050 anticipate the Seneca County population will vary by only a few thousand. The Cornell University Program on Applied Demographics forecasts that Seneca's population will be reduced by a few thousand in the decades ahead.

Historic Population						Projected Population			
1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
31,984	35,083	33,733	33683	33,342	35,251	35,622	36,937	36,211	36,452

Source: Genesee-Finger Lakes Regional Planning Council

Population stability in the towns and villages is expected to mirror the County's overall direction, even if certain development initiatives that have been proposed show greater expansion than currently indicated.

The primary development proposals are commercial expansion of the Routes 414/318 corridor in Junius and Tyre and increased business use of the Seneca Depot in Romulus. These areas are targeted economic growth places where small businesses and/or retail expansion are likely, or have been proposed, but in either situation accompanying residential expansion will remain modest. The Town of Covert has seen some residential growth extending from Tompkins County, but there are no indications that this trend will result in a dramatic population change.

Population growth and related development are expected to remain stable in the years ahead due to the following factors.

- Economic and employment growth will primarily be linked to tourism and small business development, where modest increases or changes in labor patterns are not expected to significantly offset adjustments or losses in other employment sectors.

- Communities are not planning expansion of water and sewer services, except for potential commercial growth in the Routes 414/318 corridor of Junius, Tyre and Seneca Falls. Proposals to expand sewers in Junius target retail and commercial activity in the area, but it is estimated that extension of the system could prompt the addition of up to 500 residences[1]. Seneca County is considering upgrades to existing sewage treatment facilities in the south of the county, but discussions do not include proposals for system expansion.

- County initiatives have focused on increased business development at the Seneca Depot site, where several small businesses have successfully been established, but job growth is not expected to approach a level where it would modify population trends.

- Most plans recommend that residential expansion occur in proximity to the villages and hamlets, to take advantage of the associated infrastructure and services already provided, and to reduce development pressure on areas dedicated to agriculture, natural resources and rural uses.

- While in proximity to the Rochester, Syracuse and Central Southerntier regions, Seneca County is situated well outside the core commercial zones and transportation hubs most attractive to businesses and employers. Still, Seneca County has developed its airport to make it attractive to small business and has seen success in attracting firms and jobs that seek a rural setting combined with proximity to regional and interstate transportation links. This strategy focusing on strengthening the small business economy compliments the community's wider emphasis on sustainable growth, and it is not expected to dramatically increase the area's population profile.

[1] Town of Junius Comprehensive Plan

6. Development Priorities

Most of the development and master plans prepared by Seneca County, local municipalities and area resource management groups call for applying a sustainable development approach; one that balances modest growth with the protection of agriculture, preservation of the community's rural and small town features and conservation of natural resources. Economic growth through small business development and tourism is a goal universally shared throughout Seneca County.

Tourism and Cultural Resources

Seneca County is situated in the central upstate New York region where there are extensive natural resources, recreational opportunities, an emphasis on culture and history and transportation access that makes the area an attractive destination for visitors from around the world. These valued resources combine to generate a significant tourism industry centered on its natural beauty, stunning vistas, outdoor fun, agriculture and rural marketplaces, water resources and cultural attractions. Efforts are focused on developing gateway access that will welcome and orient visitors, making it easier for tourists to access Seneca County using the interstate highways that connect the county to northeast urban centers.

Agricultural Preservation

The history and economy of Seneca County are closely linked to its agricultural roots and the dominant rural character of the area is a key feature that attracts visitors, tourists and new residents.

There is widespread support for retention and promotion of the agriculture economy, the preservation of farms and rural activities. The quiet and sparse rural setting of Seneca County, combined with its extraordinary natural resources, quaint small towns and sloping vistas are significant attractions that appeal to visitors, vacationers, retirement home buyers and new residents who seek a country and small town lifestyle.

Residential Development

Demand for residential expansion in Seneca County is expected to remain modest, primarily focused on scattered single family housing or town-house and related low-density construction. The greatest potential for residential development exists in the Seneca Falls-Waterloo corridor where there is opportunity for small business growth. Areas along the lakeshores might also see growth as people look to retire or relocate to these attractive rural and natural settings. Population changes have been gradual and housing growth has not demanded significant outlays of infrastructure and services. There has been closer scrutiny about building and infrastructure expansion in environmentally sensitive areas such as the lakeshores and slopes, which has prompted efforts to strengthen local zoning and ordinances to manage development.

Commercial Development and Services

To maintain a progressive local economy that supports jobs, active communities and a vibrant quality of life, Seneca County must seek business and commercial activity that sustains employment and revenue. Local planning calls for the development of commerce and commercial services in proximity to the villages and hamlets of Seneca County, especially in the Seneca Falls and Waterloo areas. The Route 318/414 and Thruway is also a principal growth area and Seneca County would like to see business expansion at the Seneca Depot in Romulus. There is general acceptance that commercial growth is best concentrated in areas where business activity already has a foothold and there is proximity to existing water and sewer services.

7. Potential Development Considerations

Energy Pipelines

In addition to the existing energy pipelines in Seneca County, proposals are submitted from time to time that will add pipelines and related means of energy transportions. The latest proposal from Finger Lakes LPG is to store natural gas in abandoned salt mines under Seneca Lake, which if approved could involve pipeline transport of the commodity through Seneca County. Seneca County has taken a stance against the project and interest groups in support and opposed to the proposal have provided input to NYSDEC in its pending permit process.

Existing pipelines and proposed energy projects can expose residents and communities to emergency risks and much of the opposition to these projects is centered on environmental impacts. The pipelines and projects are part of a larger regional energy distribution network that moves fuels from Canada and the Gulf of Mexico – and now Appalachian states – to high demand users throughout the northeast. These systems provide a limited number of local jobs, but not to the extent that the county's population or development profile would be altered. Their influence on hazard mitigation goals are mostly linked to emergency preparedness to address a potential fuel release, fire or explosion. Mitigation related to natural hazards such as floods and storms should be addressed in the design, permitting and regulatory process.

Natural Gas Shale Extraction

Until recently shale extraction (hydrofracking) had been an uncertain factor in considering the direction and future of development for Seneca County. The State's 2016 decision to not permit shale extraction in New York and changes in the market demand for natural gas have, at least for now, suspended plans for hydrofracking. Even when proposals to move ahead with shale extraction dominated local discussions, Seneca County was not considered a target area for this development, but it was thought that shale extraction in nearby counties would result in significant impacts for Seneca County communities. Natural gas shale extraction has substantial impacts on the development profiles of communities where it occurs because it involves wide-ranging surface operations impacting highways, housing, medical care and other services.

8. Hazard Mitigation Considerations

Many of the proposed mitigation strategies that follow in Section VI are intended to complement and enhance the development priorities outlined in local master plans and related policies referenced above.

- Stormwater management projects continue to be a priority for most communities in Seneca County. Improvements will provide significant protection for residences and improved property, and they are a key strategy for communities in protecting local roads and infrastructure from flood and storm damage. A primary goal for many communities is to prevent or reduce flooding by improving stormwater management infrastructure on local road and culverts. Other critical actions local governments can take to manage storm water and prevent flooding is to use local zoning and enforcement powers to insure building and development do not contribute to flooding, and in fact will resist flooding. This includes limiting the percentage or amount of area that structures and impervious pavement can cover on a property or lot, requiring site area reviews on all construction, extending or connecting to existing sanitary sewers where possible, and requiring erosion control technologies such as retention systems, sand filters, and use of permeable materials for paving.

- Many Seneca County communities place a strong emphasis on stream stabilization projects as a means to manage erosion and prevent flooding. Even where stabilization does not protect a specific road, bridge or improved property, stabilization is beneficial in protecting downstream properties and facilities by helping to contain erosion and the movement or collection of stream debris.

- Local plans and policies emphasize the importance of municipal floodplain management, including comprehensive flood plain management ordinances, and expanded participation in the National Flood Insurance Program (NFIP).

- In recent years, both the local master plans and hazard mitigation goals have incorporated provisions to address hazards associated with steep slopes.

- Agencies and appropriations that provide community planning and development grant funding have more consistently required that grant funded plans and development projects incorporate hazard mitigation provisions in proposals and actions.

- Hazard Mitigation actions that protect natural resources and manage development not only reduce vulnerability and losses to community infrastructure and property, but have mutual and far-reaching benefits in meeting other community priorities related to natural resource protection, commercial and business development, agricultural protection and promotion of tourism.

H. Evacuation and Disaster Housing

1. Evacuation Procedures

Evacuation procedures in Seneca County are organized around the following resources and actions.

- If the County, Municipals Officials or an Incident Commander order an evacuation, notification would be issued by the Emergency Services Office or 9-1-1 Dispatch Center. The notification will provide the following details.

  Information about the emergency condition
  How and where to obtain further and/or follow-up information
  The location or shelters hosting evacuees
  Preferred egress and travel routes
  Information for those requiring transportation or special assistance

- Public notification regarding an evacuation will be made by one or more of the following means.

  Notification to Regional Media
  Route Alerting by Public Safety personnel
  NY Alert
  Hyper – Reach

- Seneca County has agreements with the American Red Cross to operate Community Shelters. The three principal shelters the Red Cross would use, depending on the location and scope of the evacuation, include the following.

  South Seneca Middle/High School
  Romulus K-12 School
  Waterloo High School

- Evacuation Routes to these shelters are the four major north-south State routes of the County. People would be directed to the appropriate shelter along Routes 89, 96, 96A or 414. Major east-west cross roads, Route 5&20 and Route 318 connect with these north-south routes.

2. Disaster Housing

Seneca County must be prepared to host disaster housing in the event of an emergency that damages significant portions of the housing stock and forces large numbers of people to seek alternate housing. This involves designating locations in the County where temporary or permanent housing provided by FEMA or other programs can be constructed to accommodate disaster victims. These locations need to be within proximity of essential public services such as public water supply, sewers or sanitation systems, emergency services, road and transportation networks and access to food, supplies and medical care. They cannot be located in a floodplain.

In rural Seneca County, floodplains cover only a small percentage of total land area and all jurisdictions have ample space for temporary housing and future development. Seneca County has thousands of acres of suitable vacant land at the former Seneca Army Depot – that is centrally located and has access to public services - that can be used to support temporary and new housing. Disaster housing must meet applicable building codes and federal floodplain management regulations. In Seneca County, code enforcement officials would enforce building and standards for disaster housing using the NYS Uniform Fire Prevention and Building Code and NFIP floodplain management regulations.

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Town of Covert

Town of Fayette

Village of Interlaken

Town of Junius

Town of Lodi

Village of Lodi

Town of Ovid

Village of Ovid

Town of Romulus

Town of Seneca Falls

Town of Tyre

Town of Varick

Town of Waterloo

Village of Waterloo

Section VI Hazard Mitigation Strategy, Goals and Objectives

This section presents goals and objectives established for all jurisdictions in Seneca County that target actions to reduce or prevent vulnerability from natural hazards. Seneca County and its towns and villages developed these goals based on the risk and vulnerability assessments summarized in this plan, the applicable authorities and policies they can apply and the capabilities and resources available. The goals and objectives are based on input from the community, the contributions of local agencies and research undertaken by the planning team.

These mitigation goals and objectives serve to guide and focus community discussion, planning and actions that will make hazard management an important consideration for development and community improvements. The goals and objectives of this plan are compatible with the emphasis and direction of other community planning documents prepared by the County, local governments and groups supporting the protection and future of Seneca County, its communities and citizens.

This section identifies goals and objectives that were identified in the 2008 Hazard Mitigation Plan and notes the status and any changes associated with those goals. Many of the 2008 goals are carried-over as goals into this 2018 plan, although some revisions and consolidation have been incorporated where noted.

Process for Developing Hazard Mitigation Goals and Objectives

Selecting Hazard Mitigation Actions

Preparation of mitigation goals and objectives were based on the findings and analysis of the Hazard Analysis outlined in Section III, Risk Assessment, a review of the Hazard Profiles in Section IV and the Vulnerability Assessment in Section V. After a review of the hazard specific facts, records and data associated with each objective, the following issues related to each of the proposed mitigation actions were considered.

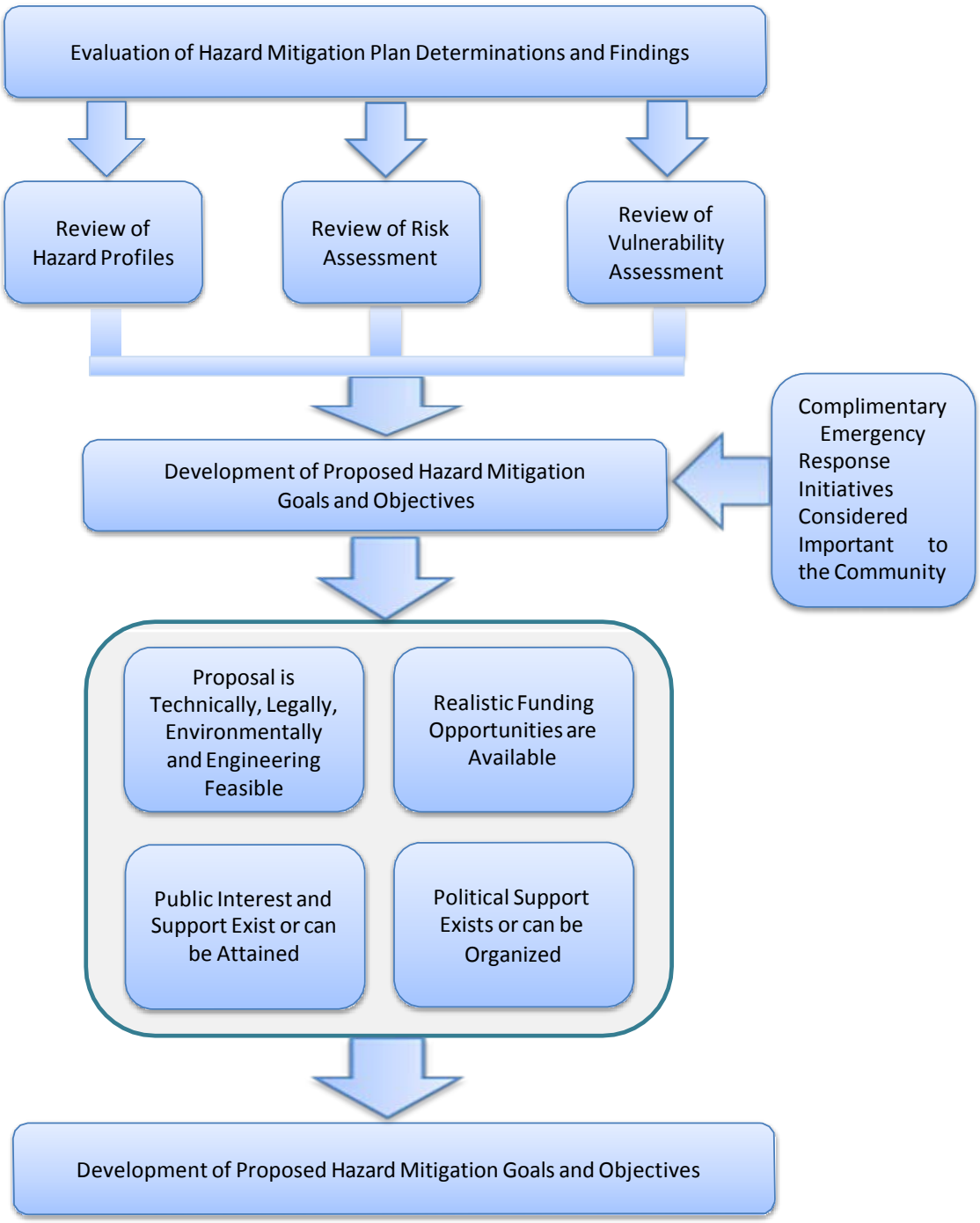
- Technical and engineering
- Legal and environmental
- Resources and funding exist or are potentially available
- Public interest exists or can be attained
- Political support exists or can be organized

Prioritizing Hazard Mitigation Actions

Priorities assigned to the hazard mitigation goals and projects included in this section were developed using the following criteria.

- Consideration of how the project will prevent or reduce natural hazards
- An evaluation of the extent of property protection that will achieved
- A determination of the community infrastructure that will be protected
- The cost and community impacts associated with a project
- An estimate of the availability of local funding
- The potential availability of grant funding or other resources
- Environmental considerations
- Legal issues and requirements
- Community support for the action
- Organizational and implementation challenges and difficulties
- Partnering and support opportunities

Process for Developing Hazard Mitigation Goals and Objectives



Organization and Presentation of Mitigation Goals and Projects

The Hazard Mitigation Goals and Objectives that follow in this section are organized in the format below.

Hazard Mitigation Goals for All Jurisdictions

2008 Goals – Revised and Continued for 2018

New Hazard Mitigation Goals Added to the 2018 Plan

Hazard Specific Objectives – 2008 and 2018

County Hazard Mitigation Projects and Goals

Town and Village Hazard Mitigation Annexes

Natural Hazards of Concern

Community Profile

Project Implementation Resources

Hazard Mitigation Projects and Goals

- Status of Projects Included in the 2008 Plan
- Completed Projects and 2008 Projects with Continuing Requirements
- New Projects Added to the 2018 Plan

Hazard Mitigation Goals for All Jurisdictions

2008 Goals – Revised and Continued for 2018	
2008 and 2018 Goals	**Status and Progress**
Goal 1* Improve life safety and damage prevention by strengthening the relationship between emergency services and hazard mitigation programs • Objective 1-1: Reduce the impact of disasters on currently developed property, especially residential, commercial, and critical public facilities that are near the lake shores and canal corridor • Objective 1-2: Improve the stability of creek banks and improve the water flow of creek beds to lessen flooding events • Objective 1-3: Lessen the impact of flooding on roads • Objective 1-4: Use the community's land use plans, ordinances, subdivision regulations and site plan review processes to enhance loss reduction • Objective 1-5: Ensure that future development is not vulnerable to the impact of natural, technological, or man-made disasters	This is a broadly applicable countywide goal that is continued in the 2017 plan. Progress achieved since 2008 is noted among the objectives below and in the County and detailed municipal summaries that follow
* Goal statement modified for the 2018 plan	

2008 Goals – Revised and Continued for 2018	
2008 and 2018 Goals	**Status and Progress**
Goal 2: Emergency Services Improvements • Objective 2-1: coordinate and integrate the hazard mitigation activities with existing local Emergency Service Agencies Emergency Operations Plans • Objective 2-2: Analyze the need for and procure any specialized equipment or training to enhance the Emergency Services response to specific hazards • Objective 2-3: Review current evacuation routes to determine if they are adequate	The County has completed remodeling of an interim Emergency Operations Center (EOC) in 2017 Since 2008, the County has consolidated and realigned emergency management, fire and 9-1-1 services Seneca County also developed a Continuity of Operations Plan (COOP) Some fire departments received federal fire and homeland security grants that help with equipment and training, but more work remains Evacuation facility site work has been done with the Red Cross but work remains on evacuation routes
Goal 3: Natural Hazards Public Education • Objective 3-1: Ensure that county residents and businesses are aware of potential hazards and are knowledgeable of their roles in limiting the effects of hazards on their personal property, health and safety • Objective 3-2: Use appropriate public information and education strategies to increase public awareness of various hazard mitigation options • Objective 3-3: Continue to educate the public about emergency preparedness, response and recovery activities • Objective 3-4: Encourage all residents and businesses to purchase NOAA Weather radios for timely alert warnings	Seneca County renewed its NWS *Storm Ready* designation that sets targets to improve public education about hazards Seneca County continues work with the Red Cross to provide family preparedness information and training Distribution of *Weather Alert Radios* to schools The Seneca County Health Department has a Public Health Educator who assists with public education about hazards Public education has been disseminated about the impact of medications and fertilizers on waste water treatment systems Emergency Management staff make presentations about hazard protection at schools, churches and community events Emergency public information is a component of local plans prepared for special events, casino operations and Thruway closure routing

Items Described as General Activities in the 2008 Plan Deleted and Consolidated with 2018 Goals	**Status and Progress**
General Activity Strengthen emergency services preparedness and response by linking emergency services with hazard mitigation programs	Consolidated with Goal #1above
General Activity Develop education programs aimed at mitigating hazards and reducing the risk to citizens, public agencies, private property, businesses, and schools	Consolidated with Goal #3 above

New Hazard Mitigation Goals Added to the 2018 Plan
Numbered in Priority Order
1. Improve awareness, understanding and access among County and local officials regarding information and opportunities available through the Hazard Mitigation Grant Program (HMGP). See Section VII. To take advantage of Hazard Mitigation Grant funding and implement proposals outlined in this plan, local officials require a better understanding and access to information about the grant funding program. Technical assistance from the State and FEMA are required.
Project Leadership: County Emergency Services and NYS Office of Emergency Management *Timeline:* 1-3 years
2. Town and Village governments in Seneca County need assistance in preparing and implementing project proposals that can address mitigation goals. The rural governments and small towns of Seneca County do not have engineering or grant writing personnel that can prepare project designs and a cost-benefit analysis needed to access FEMA mitigation funding. Local officials are primarily part-time and most highway or public works units have just a few staff who are technicians and equipment operators - consultants are prohibitively expensive. Local governments can obtain some help from the County or Soil and Water Conservation District, but the extent of help needed to access grant programs often exceeds County resources and capabilities.
Project Leadership: County Emergency Services, Community Development and Planning and NYS Office of Emergency Services *Timeline*: 1-3 years

Hazard Specific Objectives – 2008 and 2018	
2008 and 2018 Objectives	**Status and Progress**
Numbered in Priority Order	* Goal Modified for the 2018 Plan
Flood Mitigation Objectives	
1. Ensure that all new construction in the high hazard Zone-A floodplains is elevated above the 100-year elevation, or is designed and built to resist flooding, and that it will not be subject to hydrostatic pressure that can occur during flood events. *	Communities should discourage and consider local laws preventing new development in Special Flood Hazard Areas. Where building and construction occurs in these zones, local governments must enforce floodplain management regulations that will prevent flood damage. Seneca County provides code enforcement services for most local jurisdictions and applies the NYS State standard building code and flood plain management regulations
Project Leadership: Code Enforcement, Municipal Officials	*Timeline*: Continuous
2. Use local zoning, subdivision regulations and floodplain management laws to prevent or apply flood resistant measures when developing, building or remodeling in and near floodways and water courses *	Communities follow State building codes and floodplain regulations. Programs that would assist local officials in using their own zoning and regulatory powers to manage development in flood zones would improve flood protection capabilities
Project Leadership: Municipal Boards, Code Enforcement	*Timeline*: Continuous
3. Work with community officials and property owners to evaluate and consider grants and improvements that will reduce flood damage to Repetitive Loss Properties (RLP) *	There are only a few Repetitive Loss Properties in Seneca County. A comprehensive County and municipal review of steps and actions that could be taken to reduce flood losses to these properties would help with addressing this goal
Project Leadership: Code Enforcement, Planning, Municipal Officials	*Timeline*: 3-5 years
4. Add communities that are not already part of the National Flood Insurance Program * Town of Junius Village of Interlaken Village of Ovid	The Town of Lodi is now an NFIP participant The Seneca County Board of Supervisors and County Planning and Development Department will continue to work with the Town of Junius and Villages of Interlaken and Ovid about participation
Project Leadership: Planning, Emergency Services, NYS OEM, DEC, Municipal Officials	*Timeline*: 3-5 years

Hazard Specific Objectives – 2008 and 2018	
2008 and 2018 Objectives	**Status and Progress**
5. Work with other county and regional stakeholders in managing the lake level to mitigate potential lakeshore flooding	Local governments work closely with the NYS Canal Corporation, which can influence flow capacities that affect lake levels, but cannot control lake levels in high precipitation periods Efforts by property owner groups and other regional watershed and natural resource protection organizations to help with management of lake levels and flooding have been very productive
Project Leadership: Planning, Supervisors	*Timeline*: Continuous
6. A coordinated effort is needed among farmers, large land owners and municipal officials to address how farm practices can be modified to prevent uncontrolled runoff and flooding to adjacent properties. In part, drainage from today's larger farms is being directed to fewer channels that lack adequate capacity, where older and smaller farms distributed lower volumes of run-off to multiple outlets. Also, farms previously maintained greater amounts of strategically placed vegetation, including permanent hedgerows and trees, which helped slow runoff. Today, this growth is being clear-cut or removed, which contributes to dangerous runoff and flooding *	The Soil and Water Conservation District indicates these practices may contribute to flooding. A more detailed evaluation and consideration of solutions is required among the farm community and local officials
Project Leadership: Municipal Officials, County Highway, SWCD	*Timeline*: 5 or more years
7. Identify surface water drainage and stream obstructions	The County Highway Department and County Soil and Water Conservation District (SWCD) meet regularly with local officials and discuss drainage concerns
Project Leadership: Municipal Officials, County Highway, SWCD	*Timeline*: 1-3 years

Hazard Specific Objectives – 2008 and 2018	
2008 and 2018 Objectives	**Status and Progress**
8. Establish stream debris maintenance programs to regularly remove sediment and debris from streams and creeks to minimize blockages and flooding *	Most communities have annual ditching programs that mow and clear ditches. Debris buildup in creeks and streams, and at culverts and bridges, can quickly exceed the resources available to local governments Communities would benefit from assistance that helps them prepare stream maintenance plans, or aids in establishing drainage districts and related solutions
Project Leadership: Highway Officials, Municipal Leaders, NYSDEC, SWCD	*Timeline*: 5 or more years
9. Enhance data and mapping for floodplain management and identify and map flood-prone areas outside of the designated floodplains	The Seneca County Real Property Tax Office now has a Map/GIS Technician that can work with the Planning and Development Dept. on floodplain mapping improvements Certain areas of Seneca County still require FEMA floodplain map updates
Project Leadership: Planning, NYSDEC, NFIP	*Timeline*: 3-5 years
10. Encourage retrofitting of structures and apply floodplain management codes and building standards when structures are remodeled, improved or expanded in flood zones *	Communities can place greater emphasis on the application of flood protection measures when existing structures are modified, remodeled or upgraded
Project Leadership: Code Enforcement, Planning, Municipal Leaders	*Timeline*: Continuous

Hazard Specific Objectives – 2008 and 2018	
2008 and 2018 Objectives	**Status and Progress**
11. Improve flood warning and hazard notification systems	Seneca County does not have stream gauges or similar hydrologic warning devices, but coordinates flood warning capabilities with other agencies, including; National Weather Service NYS Canal Corporation NYS Forecasting and '*NY ALERT*' Since 2008, Seneca County has implemented the following services to improve weather and flood warning, notifications and information • Access to weather warnings and notifications from NYS and NWS • Upgrades to the County 9-1-1 *Computer Aided Dispatch (CAD)* system that can support flood warning efforts • Activation of '*Hyper-Reach'* technology to provide immediate public communications • Participation in NWS '*SKYWARN*'
Project Leadership: Emergency Management, NWS, Canal Corporation, NYS OES	*Timeline*: 3-5 years
12. Establish a framework to compile and coordinate surface water or stream corridor management plans and data throughout the county *	The County Highway Department and Soil and Water Conservation District monitor and support stream management planning Most existing stream and lake management planning is undertaken at the regional or watershed level Resources that could support greater emphasis on county and local stream management planning for flood protection would be a significant benefit
Project Leadership: SWCD, NYSDEC, Highway Officials	*Timeline*: 3-5 years

Hazard Specific Objectives – 2008 and 2018	
2008 and 2018 Objectives	**Status and Progress**
13. Continue use of the *NYDEC Storm Water Management Manual* and the *Seneca County Environmental Conservation Plan* to manage land use decisions and changes. This can include local land use regulations to control erosion, use of natural vegetation buffering, soil and sediment standards, grading and slope limits, plus shared and permeable driveways	The County Planning and Development Dept. and municipal planning boards use these resources for land use management Resources that could strengthen town and village plans, and actions that increase community acceptance of development planning as a flood protection strategy are important to this objective
Project Leadership: Municipal Officials, Highway Officials, Code Enforcement, SWCD	*Timeline*: 3-5 years
14. Ensure that structures such as mobile homes are securely anchored to prevent flood and wind damage	Mobile home structures must meet HUD standards. Where applicable, mobile park owners and residents are advised about this safety action
Project Leadership: Code Enforcement, Municipal Officials	*Timeline*: 3-5 years
15. Use mitigation grants and programs to retrofit, purchase and/or relocate buildings in flood-prone areas	Communities should take a closer look at using federal mitigation grant resources for improvements to private property that can prevent flood damage, particularly for Repetitive Loss Properties and those at risk in the high hazard flood zones
Project Leadership: Municipal Leaders, Emergency Services, Planning	*Timeline*: Continuous
16. Retrofit or reconstruct bridges at a higher elevation to withstand flood events	The County has replaced three (3) bridges since 2008 and retrofitted others. See the sections below about these and other proposed bridge work
Project Leadership: Highway Officials, Supervisors	*Timeline*: 5 or more years
17. Consider detention ponds and diversion practices to reduce flooding in areas of repeated flooding *	Some of this work has been done (See Village of Interlaken) and noted in the sections below These types of solutions should be considered more closely for flood trouble areas and are a common application for new development
Project Leadership: Code Enforcement, Planning, Municipal Leaders	*Timeline*: 3-5 years

Hazard Specific Objectives – 2008 and 2018	
2008 and 2018 Objectives	**Status and Progress**
18. Develop, encourage and participate in activities that address flood prevention by improving watershed management. Local mitigation coordinated with watershed protection goals outlined in the *Seneca County Environmental Conservation Plan* will benefit flood prevention and improve the natural function of the watershed *	Watershed planning is an area of significant interest in the Finger Lakes region and efforts to link municipal issues with watershed protection will be productive for flood prevention and watershed quality
Project Leadership: Code Enforcement, Planning, Municipal Leaders	*Timeline*: Continuous
19. Apply physical mitigation improvements where applicable – such as protective barriers, riprap, check dams, debris collectors and vegetation plantings *	Many of the completed local projects and proposals noted in the municipal section that follows incorporate these kinds of improvements When improving drainage systems and culverts, these kinds of projects are a cost-effective way to reduce flood losses. Greater use of vegetation and natural barriers is a proven and efficient means of flood protection that is widely supported in the community The Soil and Water Conservation District provides guidance for these types of improvements
Project Leadership: Code Enforcement, Planning, Municipal Leaders	*Timeline*: 5 years or more years
Ice Storm, Severe Storm and Flood Objectives	
23. Implement tree pruning activities to reduce threats to lives, property and utility infrastructure *	Most communities and public utilities have tree trimming programs for public rights-of-way. The collection and maintenance of tree and vegetation debris on private property that works its way into streams and causes flooding remains a problem
Project Leadership: Municipal Leaders, Highway Officials	*Timeline*: 3-5 years

Hazard Specific Objectives – 2008 and 2018	
2008 and 2018 Objectives	**Status and Progress**
23. Increase public awareness about mitigation activities for floods, storms and ice storms, to include weather advisories, watches and warnings *	See Goal #3, Objective #1 and Objective #8 above
Project Leadership: Emergency Services, Planning, Municipal Officials	*Timeline*: 3-5 years
24. Enhance strategies and prepare a plan for debris removal *	See Objective #5 above This is a strategy of greater concern for urban communities NYS and FEMA have also proposed providing assistance to local governments to prepare Debris Management plans, which would help advance this objective
Project Leadership: Highway Officials, Emergency Services, Planning	*Timeline*: 3-5 years
25. Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure	Actions for flooding are noted above Greater coordination and planning with utility companies would improve preparedness
Project Leadership: Highway Officials, Emergency Services	*Timeline*: 3-5 years
26. Enhance weather monitoring to attain earlier severe winter storm warnings	See Objective #8
Project Leadership: Emergency Services, Supervisors	*Timeline*: 3-5 years
27. Encourage enforcement of wind resistant building codes	Deleted – Seneca County implements NYS wind standards outlined in the NYS building code

County Hazard Mitigation Projects and Goals

Status of Projects Identified in the 2008 Plan		
County Road	**Description**	**Status**
CR 124, Varick	Reinforced road shoulders	Completed 2010
CR 119, Fayette	Install 2 catchbasins and drain pipe	Completed 2013
CR 139, Ovid	Install drain pipe, box culvert, gabion baskets and remove tree	Completed 2012
CR 139A, Ovid	Remove tree impinging box culvert	Completed 2012
CR 142, Covert	@ Kelly's Corners – install drainage	Completed 2010
CR 144, Covert	Install drainage	Completed 2013
CR 146, Covert	@ # 8600 – Install drainage, clean ditch	Completed 2010
CR 154, Fayette	Install drainage	Completed 2015
CR 121, Fayette	Canoga Road, Install drainage	Completed 2009
CR 141, Covert	Installed drainage and 4 catchbasins	Completed 2011
CR 143, Covert	Install Drainage	Completed 2012
CR 117 Seneca Falls/Waterloo	Install drain pipe and catchbasin	Completed 2009

Status of Projects Identified in the 2008 Plan			
County Road	**Description**	**Status**	**Cost 2018**
CR 127, Varick	Install drain pipe	Scheduled for 2018	$3,500
CR 136A, Lodi	2 sites – install larger culvert pipe and catchbasin	County Highway Local Funding Timeline: 3-5 yrs	$5,000
CR 131 Ovid and Lodi	Sites remain to be evaluated and determined		$5,000
CR 129, Romulus	@ Vineyard – Install larger drain pipe and box culvert @ Masts – Install larger drain pipe and box culvert		$8,000
CR 153, Ovid	5 sites required work Work at 2 sites to replace culvert pipes was performed in 2008 and 2010 Work remains near Deerlick Springs Road, at # 7892, across from church and 1 other site		$10,000
CR 141A, Covert	@ Powell – Install heavy steel drainage @ North box culvert – Install gabion baskets		$26,000

New Projects and Goals Included in the 2018 Plan			
County Road	**Description**	**Status**	**Cost 2018**
CR 132A Willard/Romulus	Flooding occurs on CR 132A and affects adjoining private properties and the village park. This requires NYS DOT participation since drainage improvements are needed on State Route 96A	County Highway State DOT State DOT and County Funding Timeline 3-5 yrs	Design, Engineering and Cost Estimating Must be Completed
State Route 336 from CR 121 to Olschewske Rd	This is a NYS site that requires drainage improvements where flooding impacts CR 121		
State Route 96A and private properties in the Village of Interlaken	Local officials and the Seneca County Soil & Water Conservation District (SWCD) have proposed installing a retention pond that will manage hillside runoff from Lively Run stream that crosses Route 96A and floods properties along 96A in Interlaken. *This project is also included in the list of projects and goals for the Village of Interlaken*	County Leadership SWCD Participation Village of Interlaken SWCD, County and Village Funding Timeline: 5 yrs	
CR 125, Fayette	Lake Road at Willowdale Lane Drainage improvements, drain pipe and catchbasins	County Highway Local Funding Timeline 3-5 yrs	$7,000
CR 125, Varick	Lake Road at Yale Farm and Yale Station Rds. Drainage improvements, drain pipe and catchbasins		$15,000
CR 137, Lodi	Wilkins Road – Drainage improvements; install pipes and intersections to resolve drain blockages due to beaver activity		$5,000
CR 124 Fayette & Varick	@ Brown property - Install culvert pipes and crossings and clean ditches		$7,000
CR 121, Fayette	At Ritter Road – install larger culvert pipe		$5,000
CR 139, Ovid	Work and site to be determined		TBD

New Projects and Goals Included in the 2018 Plan	
Description	**Cost 2018**
Border City / 5&20 / HEP Area Flooding associated with complex multi-jurisdictional issues has been a long-standing problem on the west side of the Town of Waterloo in the Border City/HEP Plaza areas. While the sites are adjacent or in close proximity, they can actually be defined as two separate problems or projects, one being the Border City / 5 & 20 area and the other the HEP Plaza / East Avenue site. *This requirement is also included in the annex for the Town of Waterloo* **Site #1 – Border City / 5 & 20** This includes sites around S. Preemption Road, Ayers Place, Border City Road, Sessler Road, Serven Road and the bowling alley. Flood problems in this area are linked to development that began in the 1800s and then worsened as unintegrated private, commercial and infrastructure expansion occurred over many decades. The railway's imprint on the landscape, multiple expansions of State Routes 5 & 20, development of the NYS Gas and Electric property, commercial growth and alterations to the natural wetland all contribute to today's recurring flood problems. The earliest development in this area was in the mid-1800s when the railroad was built, at a time before modern roads and when future land uses beyond agriculture were not anticipated. As automobile travel emerged in the 1900s, the first improved road was the Border City Turnpike, a privately operated toll road that roughly followed the path of today's Border City Road in the days prior to the introduction of State 5 & 20. As auto travel became dominant, portions of Border City Road were rerouted and became a County road, while State 5 & 20 was developed as the main public thoroughfare and expanded over the years. A long, slow period of commercial and residential growth followed, not always with a full understanding or acknowledgement of the drainage limitations that were compounding over this century and more of change.	Design and engineering are required, project costs would be in the millions

New Projects and Goals Included in the 2018 Plan	
Description	**Cost 2018**
Site #1 – Border City / 5 & 20 -- continued At this time, there are no specific or easy solutions to this problem due to the complex and overlapping property ownership rights involved, which are related to the difficulty in determining clear roles and responsibilities for sponsoring and funding flood mitigation -- and there has not been a modern comprehensive technical, engineering or hydrologic analysis performed that specifically identifies the problem and what can be done. As it is understood today, much of the storm water that collects north of Routes 5 & 20 must drain south to Seneca Lake. To do so, drainage must flow through areas along Border City Road where there are multiple private property owners, including NYSEG and the Finger Lakes Railroad, and runoff then passes through a protected wetland before crossing Routes 5 and 20 to the lake. Numerous culverts, ditches and drainage-ways collect and carry runoff from this area, but maintenance responsibilities for clearing growth and debris that blocks runoff is spread among various property owners and many channels are not adequately cleared and thus contribute to flooding. And then, due to the long period of unintegrated development and building expansion, it is thought that the collective drainage infrastructure is inadequate to meet modern drainage demands. The NYS Department of Transportation, Seneca County Highway and Town of Waterloo design, maintain and clean drainage structures to facilitate runoff in their areas of responsibility, but inadequate design and maintenance of drainage features across the system remain a problem. Local reports indicate that some runoff now flows to the northeast and is responsible for the flooding to the area of Sessler Road and the bowling alley. A comprehensive plan is needed that will address the complex issues and challenges associated with flooding in this area. This plan would need to address the following issues. 1. A review and analysis of the maintenance responsibilities of the various public and private property owners that share and contribute to proper management of this drainage area	Design and engineering are required, project costs would be in the millions

New Projects and Goals Included in the 2018 Plan	
Description	**Cost 2018**
Site #1 – Border City / 5 & 20 -- continued 2. Identification of any incentives, funding and/or regulatory actions that could be instituted to encourage better maintenance and improvements to the drainage infrastructure 3. Perform a technical, engineering and hydrologic analysis that examines problems, solutions and costs for flood mitigation in a comprehensive system-wide approach 4. Preparation of short-term targets and a long-range comprehensive plan for flood mitigation in the drainage area 5. Review and implement provisions to manage future development and consider needs to suspend or restrict further growth 6. Look for opportunities to remove flood prone structures from the drainage area or retrofit properties at-risk to flooding Solutions are difficult to implement because it demands an integrated strategy that is supported and funded by multiple parties; including the NYS Department of Transportation, NYS Department of Environmental Conservation, NYS Gas and Electric, Finger Lakes Railroad, Seneca County and the Town of Waterloo. There may also be implications that require participation of Ontario County and the Town of Geneva that border this site. Organizations like the State DOT and NYSEG have the capability and resources to recover from repetitive flood losses, but the Finger Lakes Railroad and Town of Waterloo lack the financial means to initiate any permanent and realistic fix on their own; which frustrates attempts to implement solutions and leaves property owners vulnerable to continued flooding and its associated costs.	Design and engineering are required, project costs would be in the millions

Site #2 – HEP Plaza / East Avenue – next page

New Projects Identified in the 2018 Plan	2018 Cost Estimate
Site #2 – HEP Plaza / East Avenue On the east side of Route 96A, south of Route 5 & 20, commercial expansion, residential development and inadequate drainage prevent storm water from reaching the Seneca Canal that results in flooding that damages property, infrastructure and poses traffic hazards. No detailed drainage or hydrologic study has been performed, but it is believed years of uncoordinated commercial and residential development contributes to flooding in the area. The removal of natural habitat, construction of expansive blacktop parking, large commercial roofs, berms, added residential properties and streets have all played a role in changing the drainage profile of the area. Design and expansion of an integrated drainage system and infrastructure to accommodate this growth has not kept pace and requires technical evaluation and updating.	Engineering, technical and hydrologic analysis are required to develop mitigation proposals

Border City / 5&20 / HEP Area
Funding Targets: Town and County, Multiple State programs, State Legislature, Federal authorities, Corporate landowners, Hazard Mitigation and SWCD *Project Leadership*: County Supervisors and Department leaders, State Legislators and Agency leaders, Congressional Representative, Supervisor, Highway Superintendent, Town Board, Corporate Executives, SWCD *Timeline*: More than 5 years

Town and Village Hazard Mitigation Annexes

An annex follows for each Town and Village in Seneca County. Each annex is organized to address the following.

Natural Hazards of Concern

Community Profile

Project Implementation Resources

Hazard Mitigation Projects and Goals

- Status of Projects Included in the 2008 Plan
- Completed Projects and 2008 Projects with Continuing Requirements
- New Projects Added to the 2018 Plan

Town of Covert

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Ice Storm
3) Winter Storm
4) Severe Storm

Other Natural Hazard Priorities

Landslide

In Seneca County, Landslide hazards are considered a secondary hazard associated with Flooding (See Section III, Risk Assessment)

Historically, Covert has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural, sparsely populated community in southeastern Seneca County where gentle open slopes and forest land in the west drain east to steeper slopes bordering Cayuga Lake. Forest, open space and farmland are dominant land uses. Wineries, seasonal housing and tourism related business are found along the lakeshore. Many residents commute to Ithaca and neighboring Tompkins County for employment and services.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Covert	2213	2,154	+2.7%	2246	-1.0%

Population Density – People Per Square Mile (2010)		
Covert	Countywide	State
72	108.5	414

Project Implementation Resources

Building a disaster resistant community that prevents flooding and reduces vulnerability to hazards begins with sound policies that manage growth and development. Strengthening the following local government tools are proven and effective ways to reduce flood risks and prevent costly disaster losses.

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Covert (T)				X		X	

X Adopted

Implementing the Hazard Mitigation goals and projects described below for Covert will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Covert Hazard Mitigation Projects and Goals

Numbered in priority order … submit updates and revisions to Seneca County Emergency Services

Work Completed Since 2008	
East Bates Road	Gabions and Rip-Rap added to improve roadside ditch drainage
Bergen Beach Road	

2008 Projects with Continuing Requirements		
Project and Status	**Continuing Requirements as of 2018**	**2018 Cost Estimate**
1. Frontenac Road Hillside runoff creates flooding when debris collects at the existing bridge abutment causing damage to the road, bridge and private property at the lakeshore. The Town replaced 2 structural beams under the bridge, one in 2012 and another in 2014.	Replace existing bridge with an open span structure that does not have a center abutment. Additional Rip-Rap and road protection are required. The Town removes debris regularly, but debris builds quickly when storms occur	$250,000 to $300,000 The Town has obtained engineering services to assist with cost estimating and identification of funding sources
Funding Targets: Awaiting consultents's recommendations *Project Leadership:* Highway Dept., Supervisor, Town Board *Timeline*: 2-3 years		

Frontenac Road bridge

Town of Covert Hazard Mitigation Projects and Goals

2008 Projects with Continuing Requirements		
Project and Status	**Continuing Requirements as of 2018**	**2018 Cost Estimate**
2. Interlaken Beach Road Hillside run-off and rising high lake level flooding combine to cause damage to the road and properties at the lakeshore.	Install additional Rip-Rap, drainageway and road protection	$85,000
Funding Targets: Town revenues, Highway, SWCD and Hazard Mitigation grants *Project Leadership* : Highway Superintendent, Town Board *Timeline*: 3-5 years		

Interlaken Beach Rd.

Town of Covert **Hazard Mitigation Projects and Goals**

New Projects Identified in the 2018 Plan	Goal
3. Management of storm debris collection on private property Farms and private property owners no longer perform the extent of maintenance or the removal of tree and natural debris collection that was once common. This natural debris collects in streams and drainageways and then causes runoff blockages that can flood sections of roadways and streets. Local officials have determined that existing culverts, drains and abutments are of adequate size and capacity (except as noted for projects above) to carry expected runoff, but these blockages on private property result in runoff being redirected to thoroughfares and adjacent properties before they reach established or intended channels.	a. Perform and assessment that identifies sites and properties where private debris collection is resulting in flooding of public rights-of-way and neighboring lands. b. Identify and implement programs and incentives that will encourage land owners to improve debris collection and disposal methods. c. Establish priorities and examine legal requirements that would permit the town to access and clear debris that threatens public interests.
Funding Targets: Private funds, Town resources, SWCD assistance *Project Leadership*: Highway Superintendent, Town Board Timeline: 3-5 years	

Town of Fayette

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Ice Storm
3) Winter Storm
4) Severe Storm

Historically, Fayette has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural, sparsely populated community in central Seneca County where gentle open slopes drain from higher elevations in the center of the Town, north to the Seneca River, west to Seneca Lake and east to Cayuga Lake. Farmland is a predominant feature throughout the town and low density residential growth has spread into northern areas of the town. Vineyards and seasonal housing stretch along both lake shores.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Fayette	3928	3,929	<1.0%	3636	+8.0%

Population Density – People Per Square Mile (2010)		
Fayette	Countywide	State
72	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Fayette (T)		X	X		C	X	X

X Adopted C Part of Comprehensive Plan

Implementing the Hazard Mitigation goals and projects described below for Fayette will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Fayette Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

Work Completed Since 2008	
Leader Road	Cleaned ditches and replaced culvert in 2015
Williamson Road	Replaced culvert and cleaned ditch in 2015
Lerch Road	Replaced culvert and cleaned ditch in 2012 A private property owner installed an overflow channel to divert floodwater
Seybolt Road	Replaced culvert and cleaned ditch in 2013
Murray Road	Cleaned ditches in 2014
Yost Road	Obtained funding and assistance from the Soil & Water Conservation District in 2009 to install new culvert pipes, gabions and clean ditches to mitigate flood conditions

Yost Road

Town of Fayette Hazard Mitigation Projects and Goals

2008 Projects with Continuing Requirements		
Project and Status	**Continuing Requirements as of 2018**	**2018 Cost Estimate**
1. Marshall Road Flooding occurs at bridge in severe storms due to insufficient channel width and capacity under the bridge and the build-up of storm debris. This causes damage to the bridge, road and wing-wall reinforcements. This portion of Marshall road provides primary emergency service and school bus access for two residences. The bridge style, placement and road approaches were designed decades ago are inadequate for today's traffic standards; one-lane traffic and weight restrictions are posted.	A new bridge with wider lanes and straightened highway approaches is required for traffic and safety upgrades. A new design would also mitigate flood risks and provide sustaining emergency service access	$400,000 to $500,000
Funding Targets: Town resources, Highway and State Legislative grants *Project Leadership* : Highway Superintendent, Town Board *Timeline*: 5 years or more		

Marshall Road bridge

Marshall Road bridge approach and lane width

Town of Fayette **Hazard Mitigation Projects and Goals**

New Projects Identified in the 2018 Plan	Goal
2. Flood Mitigation for Repetitive Loss Properties Evaluate options that can be taken by local government and private property owners to mitigate flood damage and losses for *Repetitive Loss Properties (RLP)* as identified by the National Flood Insurance Program (NFIP). **The Town of Fayette has one (1) RLP in the Canoga Island Rd. area – a single family home.** Specific information about this RLP and the NFIP are available from the Seneca County Department of Planning and Community Development, the NYS DEC Floodplain Management Program and NFIP.	Local officials need to evaluate the circumstances and conditions that result in repetitive flood losses at this property. Once evaluated, both the property owner and Town can consider options that will eliminate, reduce or mitigate flood losses to this structure. The evaluation will also examine funding opportunities available to implement corrective actions. *Mitigation actions may include following where cost effective* *Retrofitting* – Grants to help make design or elevation changes to the structure and/or utilities (flood-proofing). *Acquisition* - Grants to purchase and remove the property from the flood hazard area *Flood Protection* – Storm drainage improvements, bank stabilization or protective structures that will prevent flood damage The process also includes an evaluation of building codes, site plan reviews and flood plain management regulations to insure they are effectively applied and will prevent development in flood hazard areas.
Funding Targets: Private funds, Town resources, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership:* Supervisor, Highway Superintendent, Town Board, County support *Timeline:* 1-3 years	

Village of Interlaken

Natural Hazards of Concern Ranked 1 - 4

1) Winter Storm
2) Ice Storm
3) Flood
4) Severe Storm

Historically, Interlaken has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A small rural village within the Town of Covert in southeastern Seneca County. Natural and improved drainageways flow on moderate slopes west to east through the village. The village hosts businesses and facilities that serve residents in surrounding areas.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Interlaken	638	602	+6.0%	680	-6.3%

Population Density – People Per Square Mile (2010)		
Interlaken	Countywide	State
2,122	108.5	414

Participation in the National Flood Insurance Program (NFIP)

Even in areas where flood damages have traditionally been minimal, regular evaluation and reconsideration of community participation in NFIP is important. For villages with a low risk and history of serious flooding, flood damage always remains a threat and participation in NFIP provides well-recognized protection for citizens and property owners. Interlaken is one of three (3) communities in Seneca County that does not participate in NFIP – and Interlaken is one of only nine (9) of all towns and villages across New York State that do not participate. Later in this section, part F discusses flood risks and vulnerabilities for Seneca County. It notes that Seneca is one of three counties in the State that have the least vulnerability to flooding and Interlaken is one of the least flood prone locally. Still, flooding has and will occur in Interlaken and NFIP participation provides a cost-effective measure of protection for homeowners and residents.

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
See the Town of Covert							

Implementing the Hazard Mitigation goals and projects described below for Interlaken will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Village of Interlaken Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

2008 Projects with Continuing Requirements		
Project and Status	**Continuing Requirements as of 2018**	**2018 Cost Estimate**
1. Improvements within the village's drainage system are a top priority. Funding and work are still required.	Installation of a retention pond off Tunison Road that will prevent flooding on Lively Run stream that affects properties and residents along the south end of Main St.	$60,000 to $75,000
Funding Targets: Village resources, Highway and State Legislative grants, SWCD *Project Leadership:* Public Works Superintendent, Village Board *Timeline*: 3-5 years		

New Projects Identified in the 2018 Plan	2018 Cost Estimate
2. Stream stabilization measures, including gabions, rip-rap, drain pipes and/or related improvements to prevent flooding on Lively Run leading to Main St.	$35,000 to $55,000
Funding Targets: Town resources, Highway and State Legislative grants, SWCD *Project Leadership*: Public Works Superintendent, Village Board Timeline: 2-3 years	

Lively Run stream drains the hillside along the south end of Main Street

Stabilization was completed on the downstream side, work is also needed upstream

New Projects Identified in the 2018 Plan	2018 Cost Estimate
3. Work with County, State and federal officials to consider community participation in the National Flood Insurance Program (NFIP)	NFIP participation permits property owners to purchase flood insurance that reduces costs associated with flood damage. Community participation protects against loss of taxable assets and increases the community's eligibility for grant funding
Funding Targets: None Project Leadership: Mayor, Village Board	*Timeline*: 1-3 years

Town of Junius

Natural Hazards of Concern Ranked 1 - 4

1) Severe Storm
2) Winter Storm
3) Ice Storm
4) Flood

Historically, Junius has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural, sparsely populated town with five low density hamlets in northwest Seneca County. The terrain is relatively flat across expansive farmlands and the Montezuma marshlands. The NYS Thruway (Interstate 90) crosses the town east and west.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Junius	1408	1,471	-4.3%	1354	+4.0%

Population Density – People Per Square Mile (2010)		
Junius	Countywide	State
53	108.5	414

Participation in the National Flood Insurance Program (NFIP)

Even in areas where flood damages have traditionally been minimal, regular evaluation and reconsideration of community participation in NFIP is important. For towns with a low risk and history of serious flooding, flood damage always remains a threat and participation in NFIP provides well-recognized protection for citizens and property owners. Junius is one of three (3) communities in Seneca County that does not participate in NFIP – and Junius is one of only nine (9) of all towns and villages across New York State that do not participate. Later in this section, part F discusses flood risks and vulnerabilities for Seneca County. It notes that Seneca is one of three counties in the State that have the least vulnerability to flooding and Interlaken is one of the least flood prone locally. Still, flooding has and will occur in Junius and NFIP participation provides a cost-effective measure of protection for homeowners and residents.

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Junius (T)	X	X			X		X

X Adopted

Implementing the Hazard Mitigation goals and projects described below for Junius will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Junius Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

2008 Projects with Continuing Requirements		
Project and Status	**Continuing Requirements as of 2018**	**2018 Cost Estimate**
1. Reed Road Repetitive damage to bridge abutment due to impeded flow and inadequate design	The bridge abutment on Dublin Creek needs to be replaced. The existing double pipe restricts flow and collects debris, resulting in flood damage to the bridge. A single, oval pipe and redesigned abutment would prevent repetitive damage.	$150,000
Reed Rd		
2. Desmond Road Debris builds in ditch on private property resulting in flooding that washes away the road shoulder.	A right-of-way and/or easement needs to be established with the property owner to permit the Town to regularly clean the ditch to protect the public investment and maintain highway safety	Legal costs and annual ditch maintenance $3,500 to $6,000
3. Avery Road *(north of New Miller Rd)* Spring ice dams in ditch causing road flooding and shoulder damage	Stream stabilization measures, including gabions, rip-rap, drain pipes and/or related improvements are required to prevent flooding	$3,500 to $7,000

4. West Townline Road Storm debris plugs the railroad culvert and the road shoulder is washed away	The ditch needs to be redirected and a larger size culvert needs to be placed in a more efficient location.	$185,000
Funding Targets # 1 & 2: Town resources, Highway and State Legislative grants *Funding Targets* # 3 & 4: Town resources, Highway, State Legislative, SWCS and Hazard Mitigation *Project Leadership*: Highway Superintendent, Town Board *Timelines: 1-4 years*		

New Projects Identified in the 2018 Plan	2018 Estimated Cost
5. Avery Road *(near Justice Rd)* Spring ice and storm debris back-up at this culvert causing road flooding, shoulder damage, hazardous travel and closing of the road. An enlarged culvert capacity is required to keep this drainageway open during high flows and bank stabilization is needed to prevent road damage	$65,000 to $75,000
Funding Targets: Town resources, Highway and State Legislative, Hazard Mitigation grants *Project Leadership*: Highway Superintendent, Town Board *Timeline*: 3-5 years	
6. Work with County, State and federal officials to consider community participation in the National Flood Insurance Program (NFIP)	NFIP participation permits property owners to purchase flood insurance that reduces costs associated with flood damage. Community participation protects against loss of taxable assets and increases the community's eligibility for grant funding
Funding Targets: None Project Leadership: Mayor, Village Board *Timeline*: 1-3 years	

Town of Lodi

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Severe Storm
3) Ice Storm
4) Winter Storm

Other Natural Hazard Priorities

Landslide

In Seneca County, Landslide hazards are considered a secondary hazard associated with flooding (See Section III, Risk Assessment)

Historically, Lodi has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural, sparsely populated community in southwestern Seneca County where gentle open slopes and forest land in the east drain west to steeper slopes bordering Seneca Lake. Farming, forest land and tourism associated with vineyards, seasonal lakeside living and parks are dominant local features.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Lodi, T	1686	1,550	+8.8%	1429	+18.0%

Population Density – People Per Square Mile (2010)		
Town of Lodi	Countywide	State
51	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Lodi (T)					X		X

X Adopted

Implementing the Hazard Mitigation goals and projects described below for Lodi will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Lodi Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

Work Completed Since 2008	
*Lower Lake Road (*North*)* Install protection to reduce flood damage to road and properties when storms occur during high lake levels	Completed
Keady Road *Clean ditch and pipe outlets to prevent flood damage to road shoulder*	Completed
Neely Road *Clean ditch and pipe outlets to prevent flood damage to road shoulder*	Completed
Case Road *Clean ditch and pipe outlets to prevent flood damage to road shoulder*	Completed
Lodi-Covert Townline Road *Install drainage to prevent road flooding*	Completed

Town of Lodi Hazard Mitigation Projects and Goals

Shoreline improved to protect Lower Lake Road

New Projects Identified in the 2018 Plan	2018 Cost Estimate
1. County project to install box culvert on CR 136 at Lower Lake Road to prevent flooding	See County projects
2. Replace closed bridge on Dean Road	$350,000 to $400,000
3. Improve Upper Lake Road bridge where weight limit is in place	$150,000 to $250,000
Funding Targets: Town resources, Highway and State Legislative grants *Project Leadership*: Highway Superintendent, Town Board	*Timelines* #1 1-3 yrs #s 2 & 3 3-7 yrs

Village of Lodi

Natural Hazards of Concern Ranked 1 - 4

1) Ice Storm
2) Winter Storm
3) Flood
4) Severe Storm

Historically, Lodi has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A small village in southwest of Seneca County noted for quiet rural living and historic character. The village hosts community services for the area and is situated on moderate slopes of the Finger-Lakes that drain west to Seneca Lake.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Lodi, V	294	291	+1.0%	364	-19.2%

Population Density – People Per Square Mile (2010)		
Village of Lodi	Countywide	State
773	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Lodi (V)	See Town of Lodi						

Implementing the Hazard Mitigation goals and projects described below for Lodi will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Village of Lodi Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

2008 Projects with Continuing Requirements		
Project and Status	**Continuing Requirements as of 2018**	**2018 Cost Estimate**
Improvements within the village's drainage system are a top priority. Funding and work are still required.	This was listed as a goal in the 2008 plan, but had no specific sites or projects identified	
1. *Village Drainage West of Route 414*	New York State completed drainage improvements on State Route 414 at the site of the new library Additional flood protection work is needed in the drainageway west of the site where flooding still damages private residences The Library's engineer is examining further drainage concerns that can affect the Library and is associated runoff – additional village work will be needed.	To be Determined
Funding Targets: Private Library funds, Village resources, SWCD *Timeline*: 3-5 yrs *Project Leadership*: Public Works Superintendent, Mayor, Village and Library Boards		

Village of Lodi **Hazard Mitigation Projects and Goals**

New Projects Identified in the 2018 Plan	2018 Cost Estimate
3. Drainageway Improvements and Flood Prevention Measures Associated with Hulsey's Creek Drainage improvements to prevent flooding are required to the open ditch that leads to Hulsy's Creek and the lake - in the area bounded by State Route 414, South Washington St., CR 136A and Mill St. Poor drainage and flooding at this site has resulted in a sink hole on a village street and flooding of homes. Funding and rights of way are required	$250,000 to $500,000 Legal review and Engineering analysis are required
Funding Targets: Village resources, Highway, State Legislative and Hazard Mitigation grants, SWCD *Project Leadership*: Public Works Superintendent, Mayor, Town Board Timeline: 3-5 yrs	

Hulsey's Creek from Route 414 to Washington Street

Town of Ovid

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Ice Storm
3) Severe Storm
4) Winter Storm

Other Natural Hazard Priorities

Landslide

In Seneca County, Landslide hazards are considered a secondary hazard associated with flooding (See Section III, Risk Assessment)

Historically, Ovid has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural, sparsely populated community in south Seneca County that is bordered on the east by Cayuga Lake and the west by Seneca Lake. The moderate open slopes of the Finger Lakes drain to steeper slopes adjacent to the lakeshores. Farming dominates much of the landscape which is also noted for its vineyards, wineries and seasonal lakeshore living.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Ovid, T	2226	2,311	-3.7%	2306	-3.5%

Population Density – People Per Square Mile (2010)		
Town of Ovid	Countywide	State
71	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Ovid (T)	X	O		X			

X Adopted O Plan or Update in Development

Implementing the Hazard Mitigation goals and projects described below for Ovid will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Ovid Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

Work Completed Since 2008	
Morgan Road The Town installed a larger capacity drain pipe in 2012 to reduce flooding, protecting the road and shoulder and a nearby home	Completed – unless additional flooding occurs

2008 Projects with Continuing Requirements		
Continuing Requirements as of 2018	**2018 Cost Estimate**	**2018 Cost Estimate**
1. *Deerlick Springs Road* Powerful downhill storm drainage overwhelms and damages the roadside ditch and road shoulder. Improvements were made since 2008 with funding and assistance of the Soil and Water Conservation District.	More stabilization work to slow the water and protect infrastructure is required	$75,000 to $150,000
2. *Parish Road at CR 129* County work required to install a larger capacity pipe under the county road to prevent flooding and improve highway safety	See Seneca County projects	
Funding Targets: Town resources, Highway, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership*: Highway Superintendent, Town Board *Timelines*: #1 3-5 yrs; #2 1-2 yrs		

Roadside drainage improvements on Deerlick Springs Road

Town of Ovid Hazard Mitigation Projects and Goals

New Projects Identified in the 2018 Plan	Status
2. Flood Mitigation for Repetitive Loss Properties Evaluate options that can be taken by local government and private property owners to mitigate flood damage and losses for *Repetitive Loss Properties (RLP)* as identified by the National Flood Insurance Program (NFIP). **The Town of Ovid has two (2) RLPs in the Sheldrake Point area – both single family homes.** Specific information about these RLPs and the NFIP are available from the Seneca County Department of Planning and Community Development, the NYS DEC Floodplain Management Program and NFIP.	Local officials need to evaluate the circumstances and conditions that result in repetitive flood losses at these properties. Once evaluated, both the property owners and Town can consider options that will eliminate, reduce or mitigate flood losses to these structures. The evaluation will also examine funding opportunities available to implement corrective actions. *Mitigation actions may include following where cost effective* *Retrofitting* – Grants to help make design or elevation changes to the structures and/or utilities (flood-proofing). *Acquisition* - Grants to purchase and remove properties from the flood hazard area *Flood Protection* – Storm drainage improvements, bank stabilization or protective structures that will prevent flood damage The process also includes an evaluation of building codes, site plan reviews and flood plain management regulations to insure they are effectively applied and will prevent development in flood hazard areas.
Funding Targets: *Timeline*: 1-3 Yrs Private funds, Town resources, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership*: Supervisor, Highway Superintendent, Town Board, County support	

Village of Ovid

Natural Hazards of Concern Ranked 1 - 4

1) Ice Storm
2) Flood
3) Severe Storm
4) Winter Storm

Historically, Ovid has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Natural Hazards Assessment and Evaluation
The Village of Ovid is located on terrain that is higher than its surrounding landscape and has natural drainage paths that efficiently carry runoff toward Seneca Lake. Village officials have identified drainage problems in proximity to streets and culverts, but the village is well-protected from flooding due to this excellent natural drainage. The rural make-up of the village, with limited and low-density development and naturally occurring drainage swales have historically prevented serious flood damage. The historical record and recollections of long-time residents emphasize that the village has been fortunate to not experience any serious flooding or natural disaster losses. While the village has been included in federal disaster declarations as noted above, they were the result of county-wide declarations that affected other Seneca jurisdictions and losses were minimal in Ovid. There is no flood insurance rate map for the Village of Ovid, but areas surrounding the Village are designated Zone X (outside the 500-Year floodplain). The elevation of the Village rises above the surrounding landscape and its natural slopes carry drainage away from the village. Village officials participate in county and regional initiatives for disaster and natural hazard protection that can affect all jurisdictions in the area - such as preparedness for severe storms, tornados, snow emergencies, power outages, school and public health threats.

Community Profile

A rural village in southwest Seneca County situated on the crown of gentle slopes that drain west to Seneca Lake. Proud of its small-town, out-of-the way character, it serves as a village business and community center for south Seneca County.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Ovid, V	620	602	+3.0%	660	-6.0%

Population Density – People Per Square Mile (2010)		
Village of Ovid	Countywide	State
1,378	108.5	414

Participation in the National Flood Insurance Program (NFIP)

Even in areas where flood damages have traditionally been minimal, regular evaluation and reconsideration of community participation in NFIP is important. For villages with a low risk and history of serious flooding, flood damage always remains a threat and participation in NFIP provides well-recognized protection for citizens and property owners. The Village of Ovid is one of three (3) communities in Seneca County that does not participate in NFIP – and Ovid is one of only nine (9) of all towns and villages across New York State that do not participate. Later in this section, part F discusses flood risks and vulnerabilities for Seneca County. It notes that Seneca is one of three counties in the State that have the least vulnerability to flooding and Ovid is one of the least flood prone locally. Still, flooding has and will occur in Ovid and NFIP participation provides a cost-effective measure of protection for homeowners and residents.

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
See Town of Ovid							

Implementing the Hazard Mitigation goals and projects described below for Ovid will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Village of Ovid Hazard Mitigation Projects and Goals

New Projects Identified in the 2018 Plan	Cost Estimate 2018
1. Install a larger culvert on Clark St. near Water St. to accommodate greater storm flows and improve bank restoration to protect the street and shoulders	$15,000
2. Work with the County to realign stream flow where it crosses East Seneca St and enlarge the culvert to prevent the back-up of stormwater that floods the street and low-lying property at the site.	$45,000 - $65,000
Funding Targets: Village resources, County Support, Highway and Hazard Mitigation grants, SWCD *Project Leadership*: Public Works Superintendent, Town Board	
3. Work with County, State and federal officials to consider community participation in the National Flood Insurance Program (NFIP)	NFIP participation permits property owners to purchase flood insurance that reduces costs associated with flood damage. Community participation protects against loss of taxable assets and increases the community's eligibility for grant funding
Funding Targets: None Project Leadership: Mayor, Village Board	*Timelines*: #1 1-3 Yrs #2 2-3 Yrs #3 1-3 Yrs

Clark Street

East Seneca Street

Town of Romulus

Natural Hazards of Concern Ranked 1 - 4

1) Ice Storm
2) Flood
3) Severe Storm
4) Winter Storm

Other Natural Hazard Priorities

Landslide

In Seneca County, Landslide hazards are considered a secondary hazard associated with flooding (See Section III, Risk Assessment)

Historically, Romulus has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural community in central Seneca County that is bordered on the east by Cayuga Lake and the west by Seneca Lake. The moderate open slopes of the Finger Lakes drain from the Town's center east and west to steeper slopes near the lakeshores. 76% of the land area in Romulus is classified as farmland and there are wineries, parks and seasonal housing adjacent to the lakes. The former Seneca Army Depot that overlays more than 6,000 acres of the Town is now targeted for industrial and recreational development and hosts State and County correctional facilities.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Romulus	4333	4,316	<1.0%	2532	+71.1%*

* 2010 and 2015 census data include State and County prison populations

Population Density – People Per Square Mile (2010)		
Romulus	Countywide	State
114	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Romulus (T)	Z	X	X		X	X	

X Adopted Z Part of Zoning

Implementing the Hazard Mitigation goals and projects described below for Romulus will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Romulus Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

Status of Projects Identified in the 2008 Plan
The 2008 plan stated that Improvements within the Town's drainage system were a top priority, but no specific sites or projects were identified

New Projects Identified in the 2018 Plan	2018 Cost Estimate
1. Yarnell Road At Yarnell road off CR 138, the Town has replaced the culvert 3 times between 2008 and 2015, each time increasing the size to its current 5 X 7 capacity. The size is still not adequate, however, and the site is expected to flood again. The problem is more serious because adjacent farmland owners have removed hedgerows and increased field tilling, which contributes to runoff. Managing farmland runoff would improve the situation, otherwise increasing flow capacity may require installing a bridge rather than a larger culvert.	$75,000 to $400,000
2. Vineyard Road Technical analysis is required, but a ditch or other options need to be considered to divert flooding that damages Vineyard Road from CR 129 to Route 89	$75,000 to $150,000
3. Lakeshore and Slope Flooding - near Vineyard and Swick Roads Homes and sites along Cayuga Lake in this area are exposed to both lakeshore and down slope flooding, and the clearing and installation of drain tile in upland farm fields may be contributing to runoff. Hydrology analysis is required and managing farm runoff might be one solution, or the installation of down slope check-dams could be an option.	$150,000 to $350,000
Funding Targets: Town resources, Highway, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership*: Highway Superintendent, Town Board *Timelines*: 3-5 Yrs	

Town of Romulus Hazard Mitigation Projects and Goals

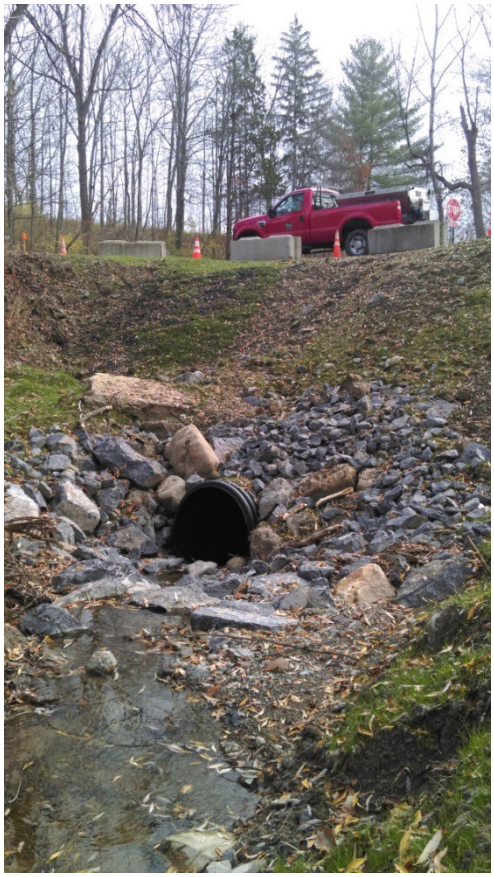
Above this and other roads along Cayuga Lake, storm runoff from steep slopes and farm field drainage practices contribute to roadway, home and property damage below.

New Projects Identified in the 2018 Plan	2018 Cost Estimate
4. Cayuga Lake Road – between Stout Road and Route 89 There are multiple ravine banks sites in this area composed of silt and unstable ground where floodwaters cause erosion and threaten stability and safety of the road. The road needs to remain open for emergency access but is occasionally closed until it can be temporarily reinforced. Fill and temporary measures do not work, however, and the site remains at risk. A permanent bank stabilization design, piling or related improvements are required.	$75,000 to $250,000 Each site
Work was completed at one of these sites in 2016 at the intersection of Stout Rd. and Cayuga Lake Rd. A drainage improvement project was completed that included installation of larger capacity culvert pipes, improved slope design and stone reinforcement. Assistance with this project was provided by the Seneca County Soil and Water Conservation District (SWCD).	Completed
Funding Targets: Town resources, Highway, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership*: Highway Superintendent, Town Board	

Town of Romulus **Hazard Mitigation Projects and Goals**

Road shoulder and embankment washouts have occurred at this and other sites in the vicinity, where temporary fill has been placed but permanent restoration and protection are required.

This culvert enlargement and bank stabilization was completed at Stout Rd. and Cayuga Lake Rd. in 2016



Town of Seneca Falls

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Ice Storm
3) Severe Storm
4) Winter Storm

Other Natural Hazard Priorities

Tornado

Dam Failure*

* Dam Failure is considered a structural risk, not a natural hazard, but the risk and impacts are generally associated with flooding

Historically, Seneca Falls has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A moderately sized town in central Seneca County that contains the former Seneca Falls village. The town and village combine with the neighboring Town and Village of Waterloo to form the commercial and industrial center of Seneca County. The Seneca River and Cayuga-Seneca Canal, which has one lock and one dam within the town, traverse the town and are a focus of the area's tourism and business activity. The Seneca Falls village is a traditional residential hub with small industry and mixed commercial activity. Residential neighborhoods and small business extend beyond the village to portions of the surrounding town, while open space and rural uses are predominant in outlying sections of the town.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Seneca Falls	8848	9,043	-2.2%	9384	-5.7%

Population Density – People Per Square Mile (2010)		
Seneca Falls	Countywide	State
376	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Seneca Falls (T)	Z	X	X			X	

X Adopted Z Part of Zoning

Implementing the Hazard Mitigation goals and projects described below for Seneca Falls will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Seneca Falls Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

Status of Projects Identified in the 2008 Plan	Continuing Requirements as of 2018	Updated Cost Estimate 2018
1. Noble Road at Farron Road Heavy rain and poor drainage washed out road shoulder and driveways. In 2015, Town officials met with residents, performed hydrological surveys and cleaned ditches.	Obtain resident approvals and easements and replace existing drainage and culvert pipes. Installation of another ditch is required to fully mitigate flood threats and protect residential properties	$75,000 to $150,000
2. Kingdom Road Install larger culvert pipes. The Town has replaced one section of pipe	Another culvert pipe needs to be replaced	$10,000 to $15,000
3. Hyatt and Desmond Roads Occasional flooding occurs on these Town roads related to design and needed improvements to the privately operated utility hydro dams and state locks on the New York State Canal.	Design Improvements to the privately operated utility hydro dams and state locks would provide greater protection for these Town of Seneca roads	Coordination with New York State Canals and the Seneca Power Corporation
Funding Targets #1 & 2: Town resources, Highway, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership*: Highway Superintendent, Supervisor, Town Board *Timelines*: #1 2-5 Yrs #2 1-3 Yrs #3 3-5 Yrs		

Town of Seneca Falls Hazard Mitigation Projects and Goals

New Projects Identified in the 2018 Plan	Status
4. Flood Mitigation for Repetitive Loss Properties Evaluate options that can be taken by local government and private property owners to mitigate flood damage and losses for *Repetitive Loss Properties (RLP)* as identified by the National Flood Insurance Program (NFIP). **The Town of Seneca Falls has two (2) RLPs in the Pumphouse and Lower Lake Rd. areas – both single family homes**. Specific information about these RLPs and the NFIP are available from the Seneca County Department of Planning and Community Development, the NYS DEC Floodplain Management Program and NFIP.	Local officials need to evaluate the circumstances and conditions that result in repetitive flood losses at these properties. Once evaluated, both the property owners and Town can consider options that will eliminate, reduce or mitigate flood losses to these structures. The evaluation will also examine funding opportunities available to implement corrective actions. *Mitigation actions may include following where cost effective* *Retrofitting* – Grants to help make design or elevation changes to the structures and/or utilities (flood-proofing). *Acquisition* - Grants to purchase and remove properties from the flood hazard area *Flood Protection* – Storm drainage improvements, bank stabilization or protective structures that will prevent flood damage The process also includes an evaluation of building codes, site plan reviews and flood plain management regulations to insure they are effectively applied and will prevent development in flood hazard areas.
Funding Targets: *Timeline*: 1-3 Yrs Private funds, Town resources, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership*: Supervisor, Highway Superintendent, Town Board, County support	

Noble Road at Farron Road, Town of Seneca Falls

Town of Seneca Falls (Village) **Hazard Mitigation Projects and Goals**

The Village of Seneca Falls government was discontinued in 2012 and municipal governance and operations were consolidated with the Town of Seneca Falls. The following were listed as Village projects and goals in the 2008 Hazard Mitigation Plan and remain a separate listing as a way to monitor their identity and status.

Projects Listed in the 2008 Plan that are Completed	Work Completed
Boston Avenue	Installed larger drain pipes, new catchbasins and removed cross connections
Porter Street	
Walnut Street Outfall	
Miller Street / Lower Walnut	

Other Work Performed Since 2008	Continuing Requirements as of 2018	Updated Cost Estimate 2018
1. Rumsey Street Options A & B Partial work on new outfall was completed on Rumsey Street	Work remains to be done on the Ridge end of Rumsey	$100,000 to $250,000
2. Walnut Street – Oak to Ridge Some work has been done on Walnut Street	Additional drainage upgrades and improvements	$150,000 to $225,000
Funding Targets: Town resources, Highway and State Legislative grants *Project Leadership*: Highway Superintendent, Town Board *Timelines*: 3-5 Yrs		

Town of Seneca Falls (Village) **Hazard Mitigation Projects and Goals**

3. Continuing Requirements as of 2018	Description	Updated Cost Estimate 2018
Laws Lane – Ridge to Walnut	Village flood risks will be reduced by improvements and upgrades to existing drainage infrastructure at each of these sites; including larger drain pipes, new catchbasins, realignment of drainage pathways and removing cross connections. In some cases, like the Lincoln Avenue and Clinton–Black Brook projects, residential input and/or rights-of-way and easements are required. These priorities are associated with the Village drainage study prepared by MRB Engineering Group. These projects are re-evaluated each year in advance of the Town's budget preparation to determine conditions and priorities for funding	Cost estimates for flood mitigation work at each of these sites range from $5,000 to more than $200,000 and are outlined in the MRB study.
Lincoln Avenue		
Canoga Street		
Garden Street – 8 Ft. culvert		
Maple Street		
State Street near Jefferson		
Auburn Road		
Outfall pipe in cemetery		
Cortland Avenue / West Bayard		
Cayuga Street		
Leland Drive		
South and Hoag Streets		
Peterman Road near Thorpe		
East Garden Street near Stevenson		
Garden Street (East) – Montgomery to Nicholas		
Elm Street / White Street		
Pinehurst culvert		
Peterman Road near Sullivan		
Garden Street (West) – Meadow to Spring		
Garden Street – Nicholas Street intersection		
Municipal Park		
Chapel Street – Troy to State		
Troy Street – John to Chapel		
Beryl Avenue		
Bridge Street		
Clinton – Black Brook channel		
Funding Targets: Town resources, Highway, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership*: Highway Superintendent, Town Board *Timeline*: Evaluated each year to determine which can be achieved in the annual budget and revenue cycle		

Town of Seneca Falls (Village) **Hazard Mitigation Projects and Goals**

Continuing Requirements as of 2018	Updated Cost Estimate 2018
Implement a regular tree trimming and debris maintenance program to reduce drain blockages that contribute to flooding and prevent losses associated with ice storms and power outages. Also plant new trees that are resistant to natural hazards.	Requires funding source, approximately $100,000
Funding Targets: Town resources, State Legislative grants *Project Leadership*: Highway Superintendent, Supervisor, Town Board	

Rumsey Street, looking south from Ridge Street

Walnut Street, north to Ridge Street

Town of Tyre

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Severe Storm
3) Ice Storm
4) Winter Storm

Historically, Tyre has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural, sparsely populated town in northeast Seneca County where increasing commercial expansion is occurring at two locations. The entire town is designated an agricultural district and citizens have expressed their preference to manage growth and maintain the town's rural character. Development is centered in two designated business zones: 1) Magee Corners, along State Route 414 from the NYS Thruway Exit 41 to south of the intersection with State Route 318; and 2) around the five corners intersection of US Route 20, and State Routes 5, 89 and 318. These locations are some of the highest traffic areas in Seneca County and are attractive locations for a variety of customer-oriented businesses. The existing outlet mall, State casino and proposals for additional commercial uses are centered where the State Thruway (Interstate 90), Route 414 and Route 318 intersect and extend west through the town. Large areas of the town are federally managed Montezuma marshlands and the NYS Cayuga-Seneca and Erie Canals traverse the north and east portions of the town. The town's terrain is relatively flat and drains north and east through grasslands and marsh.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Tyre	923	981	-6.0%	870	+6.1%

Population Density – People Per Square Mile (2010)		
Tyre	Countywide	State
29	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Tyre (T)	X	X	X			X	

X Adopted

Implementing the Hazard Mitigation goals and projects described below for Tyre will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Tyre Hazard Mitigation Projects and Goals

Numbered in priority order … Contact Seneca County Emergency Services to update, revise and add projects

Status of Projects Identified in the 2008 Plan	Continuing Requirements as of 2018	Updated Cost Estimate 2018
Worden Road Work at this site is complete. Crossover drain pipes were replaced and ditches were cleared of debris	Completed	
1. Chase Road Roadside ditches and drainage were cleared of debris	Work is needed to improve drainage in wetland areas to prevent flooding of roads and improved property. This includes action to establish private property rights-of-way or easements that permit town access to remove vegetation and natural debris.	TBD
2. Strong Road A larger capacity culvert pipe was installed and ditches were cleared of debris	Development of the Seneca Meadows Landfill redirected Black Brook Creek, resulting in area drainage problems that may worsen over time. Conditions in this area also need to be monitored to determine if State casino development in neighboring Tyre will impact drainage. Drainage issues must be addressed with landfill and casino operators to insure design and maintenance are mitigated and conform with the Town's site plan review authority.	A coordinated design and cost proposal must be prepared by the developer(s) and Town
3. West Tyre Road Ditch debris clearance is required	Debris clearance is required at several locations along W. Tyre Rd from Gravel Rd. to Rt. 414. Particularly at bridges, culverts and intersections where flow is restricted and woody off-land storm debris collects.	$6,000

Funding Targets:
Town resources, Highway, Hazard Mitigation and State Legislative grants, SWCD
Project Leadership: Highway Superintendent, Town Board *Timelines*: 1-4 Yrs

Town of Tyre Hazard Mitigation Projects and Goals

Goals and Emphasis Implemented Since the 2008 Plan
Increasing commercial activity in the Rts. 414/318 corridor has prompted town officials to place greater emphasis and application on zoning and land use management to prevent flooding and control drainage. Flood and hazard mitigation goals by Town officials now emphasize the use of tools like zoning, site plan reviews and subdivision regulations to implement effective drainage and reduce flood risks.
The draft of a revised *Routes 414 And 318 Commercial Corridor Master Plan* was completed in November 2017. The plan includes recommendations for zoning and land use to manage growth in the area and addresses stream corridor and wetland protection.
The following local laws have recently been developed and approved or drafts are proposed and under review: Planned Unit Development, Draft, April 2017 Subdivision Regulations, Approved 2015 Site Plan Review Law, Approved 2015 Zoning Law, Draft Amendments, 2017 Updated Comprehensive Plan, 2014
A water feasibility study for the Route 318/414 area, which has the greatest potential for development, will help to manage growth by promoting effective drainage and flood control.
A sewer district is under consideration for the Thruway/Route 414 area where significant development is concentrated.

Casino development, Route 414, Tyre

Town of Varick

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Winter Storm
3) Severe Storm
4) Ice Storm

Historically, Varick has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A rural, sparsely populated community in central Seneca County that is bordered on the east by Cayuga Lake and the west by Seneca Lake. 63% of the land area in Varick is classified as farmland and the moderate open slopes of the Finger Lakes drain from the town's center east or west to the lakes. Vineyards, tourism and seasonal lakeshore living are featured along the lakeshores. The former Seneca Army Depot overlays about 4,000 acres of the town and is a potential development site for industry, recreation and institutional uses.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Varick	1914	1,857	+3.0%	2161	-11.4%

Population Density – People Per Square Mile (2010)		
Varick	Countywide	State
59	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Varick (T)		X	X		C	X	

X Adopted C Part of Comprehensive Plan

Implementing the Hazard Mitigation goals and projects described below for Varick will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Varick Hazard Mitigation Projects and Goals

Priorities numbered in order … Contact Seneca County Emergency Services to update, revise and add projects

Status of Projects Identified in the 2008 Plan	Continuing Requirements as of 2018
Drainage improvements and stream maintenance No identified sites or specific projects were listed in the 2008 plan, but the town has continued with regular maintenance and made upgrades where possible	Work on these projects will continue.
Removal of dead trees and limbs to prevent power outages Maintenance work will continue as needed	
Public Education to improve citizen capabilities to resist disaster The community participates in initiatives sponsored by the County, NWS and Red Cross	
Funding Targets: Local *Project Leadership*: Town Highway, County Highway, SWCS *Timeline*: Continuous	

New Projects Identified in the 2018 Plan	2018 Cost Estimate
1. Projects to control erosion and minimize damaging runoff Install structural measures along steeper roads, road banks and high flow ditches to control erosion and sedimentation and to minimize downslope flooding. These projects are identified as a goal in the Town Comprehensive Plan and could involve the use of natural vegetation such as native grasses, installation of reinforcing materials like water permeable geomats or the terracing of slopes. Targeted sites are downslope channels to the lakes above shoreline properties on Seneca Lake, near Willow Cove and Driftwood La., south to Hahnel and Deal Rds.; and on slopes to Cayuga Lake east of Kings Corners and McDuffie Rds. Funding and/or assistance for design and engineering is required to identify specific locations where work will be cost-effective and which measures are appropriate.	Projects that apply natural vegetation can be under $10,000, sites requiring structural materials and work could exceed $25,000
Funding Targets: Town resources, Highway, Hazard Mitigation and State Legislative grants, SWCD *Project Leadership:* Highway Superintendent, Town Board *Timeline*: 3-5 Yrs	

Town of Varick **Hazard Mitigation Projects and Goals**

New Projects Identified in the 2018 Plan	2018 Cost Estimate
2. Work with the Seneca County Soil and Water Conservation District and the USDA Natural Resources Conservation Service (NRCS) to encourage farmland owners to apply conservation practices that reduce runoff from agricultural lands. As small family farms are consolidated into larger corporate tracts, drainage that was previously directed from smaller plots to multiple outlets is now congregated and directed to fewer outlets with inadequate downstream capacity.	Apply guidance, incentives and land use regulations that encourage private land-owner funding
Funding Targets: Town resources, SWCD, Hazard Mitigation and State Legislative grants *Project Leadership*: Supervisor, Highway Superintendent, Town Board *Timeline*: 3-5 Yrs	

Town of Waterloo

Natural Hazards of Concern Ranked 1 - 4

1) Flood
2) Ice Storm
3) Severe Storm
4) Winter Storm

Other Natural Hazard Priorities

Tornado

Historically, Waterloo has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A moderately sized town in central Seneca County that combines with the neighboring Village of Waterloo and Town of Seneca Falls to form the commercial and industrial center of Seneca County. Seneca Lake at the town's southwest border flows to the Seneca River and Cayuga-Seneca Canal along the town's south border. Higher density residential and commercial development are predominant in the south of the town near the Village of Waterloo and along the Route 5 & 20 corridor. Rural and low-density uses define northern areas of the town.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Waterloo, T	7595	7,642	<1.0%	7765	-2.2%

Population Density – People Per Square Mile (2010)		
Town of Waterloo	Countywide	State
353	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Waterloo (T)	Z	X	X			X	

X Adopted Z Part of Zoning

Implementing the Hazard Mitigation goals and projects described below for Waterloo will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Town of Waterloo Hazard Mitigation Projects and Goals

Priorities numbered in order … Contact Seneca County Emergency Services to update, revise and add projects

Status of Projects Identified in the 2008 Plan	Continuing Requirements as of 2018	2018 Cost Estimate
Maney, Hecker and Steele Roads Require ditching, regular maintenance and debris clearance to prevent flooding and damages to roads and private property.	Work remains to clear ditches and remove debris. Planning and resources are needed to establish a Town program for regular ditch maintenance and debris clearance.	More than $40,000 to perform current work. Establish provisions and funding for a regular or annual maintenance debris program.
Funding Targets: Town resources, Highway and State Legislative grants, SWCD *Project Leadership*: Highway Superintendent, Town Board *Timeline*: 2-4 Yrs		

New Projects Identified in the 2018 Plan	2018 Cost Estimate
1. Border City / 5&20 / HEP Area Flooding associated with complex multi-jurisdictional issues has been a long-standing problem on the west side of the Town of Waterloo in the Border City/HEP Plaza areas. While the sites are adjacent or in close proximity, they can actually be defined as two separate problems or projects, one being the Border City / 5 & 20 area and the other being the HEP Plaza / East Avenue site. *This requirement is also included in the section for Seneca County Projects* *-- continues –*	Design and engineering are required, project costs would be in the millions

Town of Waterloo Hazard Mitigation Projects and Goals

New Projects Identified in the 2018 Plan	2018 Cost Estimate
Site #1 – Border City / 5 & 20 This includes sites around S. Preemption Road, Ayers Place, Border City Road, Sessler Road, Serven Road and the bowling alley. Flood problems in this area are linked to development that began in the 1800s and then worsened as unintegrated private, commercial and infrastructure expansion occurred over many decades. The railway's imprint on the landscape, multiple expansions of State Routes 5 & 20, development of the NYS Gas and Electric property, commercial growth and alterations to the natural wetland all contribute to today's recurring flood problems. The earliest development in this area was in the mid-1800s when the railroad was built, at a time before modern roads and when future land uses beyond agriculture were not anticipated. As automobile travel emerged in the 1900s, the first improved road was the Border City Turnpike, a privately operated toll road that roughly followed the path of today's Border City Road in the days prior to the introduction of State 5 & 20. As auto travel became dominant, portions of Border City Road were rerouted and became a County road, while State 5 & 20 was developed as the main public thoroughfare and expanded over the years. A long, slow period of commercial and residential growth followed, not always with a full understanding or acknowledgement of the drainage limitations that were compounding over this century and more of change. At this time, there are no specific or easy solutions to this problem due to the complex and overlapping property ownership rights involved, which are related to the difficulty in determining clear roles and responsibilities for sponsoring and funding flood mitigation -- and there has not been a modern comprehensive technical, engineering or hydrologic analysis performed that specifically identifies the problem and what can be done.	Design and engineering are required, project costs would be in the millions

Town of Waterloo Hazard Mitigation Projects and Goals

New Projects Identified in the 2018 Plan	2018 Cost Estimate
Site #1 – Border City / 5 & 20 -- continued As it is understood today, much of the storm water that collects north of Routes 5 & 20 must drain south to Seneca Lake. To do so, drainage must flow through areas along Border City Road where there are multiple private property owners, including NYSEG and the Finger Lakes Railroad, and runoff then passes through a protected wetland before crossing Routes 5 and 20 to the lake. Numerous culverts, ditches and drainage-ways collect and carry runoff from this area, but maintenance responsibilities for clearing growth and debris that blocks runoff is spread among various property owners and many channels are not adequately cleared and thus contribute to flooding. And then, due to the long period of unintegrated development and building expansion, it is thought that the collective drainage infrastructure is inadequate to meet modern drainage demands. The NYS Department of Transportation, Seneca County Highway and Town of Waterloo design, maintain and clean drainage structures to facilitate runoff in their areas of responsibility, but inadequate design and maintenance of drainage features across the system remain a problem. Local reports indicate that some runoff now flows to the northeast and is responsible for the flooding to the area of Sessler Road and the bowling alley. A comprehensive plan is needed that will address the complex issues and challenges associated with flooding in this area. This plan would need to address the following issues. 7. A review and analysis of the maintenance responsibilities of the various public and private property owners that share and contribute to proper management of this drainage area 8. Identification of any incentives, funding and/or regulatory actions that could be instituted to encourage better maintenance and improvements to the drainage infrastructure 9. Perform a technical, engineering and hydrologic analysis that examines problems, solutions and costs for flood mitigation in a comprehensive system-wide approach	Design and engineering are required, project costs would be in the millions

Town of Waterloo Hazard Mitigation Projects and Goals

New Projects Identified in the 2018 Plan	2018 Cost Estimate
Site #1 – Border City / 5 & 20 -- continued 10. Preparation of short-term targets and a long-range comprehensive plan for flood mitigation in the drainage area 11. Review and implement provisions to manage future development and consider needs to suspend or restrict further growth 12. Look for opportunities to remove flood prone structures from the drainage area or retrofit properties at-risk to flooding Solutions are difficult to implement because it demands an integrated strategy that is supported and funded by multiple parties; including the NYS Department of Transportation, NYS Department of Environmental Conservation, NYS Gas and Electric, Finger Lakes Railroad, Seneca County and the Town of Waterloo. There may also be implications that require participation of Ontario County and the Town of Geneva that border this site. Organizations like the State DOT and NYSEG have the capability and resources to recover from repetitive flood losses, but the Finger Lakes Railroad and Town of Waterloo lack the financial means to initiate any permanent and realistic fix on their own; which frustrates attempts to implement solutions and leaves property owners vulnerable to continued flooding and its associated costs.	

Town of Waterloo Hazard Mitigation Projects and Goals

New Projects Identified in the 2018 Plan	2018 Cost Estimate
Site #2 – HEP Plaza / East Avenue On the east side of Route 96A, south of Route 5 & 20, commercial expansion, residential development and inadequate drainage prevent storm water from reaching the Seneca Canal that results in flooding that damages property, infrastructure and poses traffic hazards. No detailed drainage or hydrologic study has been performed, but it is believed years of uncoordinated commercial and residential development contributes to flooding in the area. The removal of natural habitat, construction of expansive blacktop parking, large commercial roofs, berms, added residential properties and streets have all played a role in changing the drainage profile of the area. Design and expansion of an integrated drainage system and infrastructure to accommodate this growth has not kept pace and requires technical evaluation and updating.	Technical and hydrologic analysis are required to develop mitigation proposals
Funding Targets: Town and County, Multiple State programs, State Legislature, Federal authorities, Corporate landowners, Hazard Mitigation and SWCD *Project Leadership*: County Supervisors and Department leaders, State Legislators and Agency leaders, Congressional Representative, Supervisor, Highway Superintendent, Town Board, Corporate Executives, SWCD *Timeline*: More than 5 years	

2. Reed Road Bridge at Kings Row Development Bridge has maintenance issues and requires replacement	$350,000 to $450,000
Funding Targets: Town and County resources, Highway and State Legislative grants *Project Leadership*: Highway Superintendent, Town Board *Timeline*: More than 5 years	

Town of Waterloo Hazard Mitigation Projects and Goals

Border City Road at Folger Street (left) looking southwest – storm drainage from this area must make its way through a protected wetland, raised railroad bed and State highway (located on the back side of these homes) to reach Seneca Lake

The HEP commercial plaza and nearby East Avenue (right) have been vulnerable to flooding for many years

Stormwater causes flooding in the neighborhood around Fallbrook Street and Ayers Place (at left, looking south to Border City Road) because flow to Seneca Lake is impeded

Village of Waterloo

Natural Hazards of Concern Ranked 1 - 4

1) Ice Storm
2) Flood
3) Severe Storm
4) Winter Storm

Other Natural Hazard Priorities

Tornado

Dam Failure*

* Dam Failure is considered a structural risk, not a natural hazard, but the risk and impacts are generally associated with flooding

Historically, Waterloo has received five natural disaster or emergency declarations for Blizzard (1), Ice Storm (1), Tropical Storm and/or Flooding (3). There is a risk of damaging Tornados and Earthquakes in all of Seneca County and populated or developed areas have increased vulnerability.

Community Profile

A moderately sized village in central Seneca County that combines with the neighboring Towns of Waterloo and Seneca Falls to form the commercial and industrial center of Seneca County. The Seneca River and Cayuga-Seneca Canal, with a power generating dam in the village, traverse the village and are the focus of the area's tourism and business activity. The Village of Waterloo is a traditional residential hub with mixed commercial activity that provides employment and services for residents throughout the county.

Town	Estimate 2015	Population 2010	% change 2010-2015	Population 1990	% change 1990-2015
Waterloo, V	5178	5,171	<1.0%	5116	+1.2%

Population Density – People Per Square Mile (2010)		
Village of Waterloo	Countywide	State
2,393	108.5	414

Project Implementation Resources

Land Use Plans and Regulations							
Municipality	**Site Plan Review**	**Comprehensive Plan**	**Zoning**	**Land Management Law**	**Farmland Protection Plan**	**Subdivision**	**Right to Farm**
Waterloo (V)	Z		X	X		X	

X Adopted Z Part of Zoning

Implementing the Hazard Mitigation goals and projects described below for Waterloo will often require integrated leadership, planning and resources from multiple governments and the input of citizens and property owners. Funding and resources for the design, construction and/or installation of Hazard Mitigation improvements can come from one or more of the following programs and resources.

Funding and Assistance Planning, Design, Engineering, Permits, Citizen Participation, Construction	
Local Resources and Budgets	FEMA Hazard Mitigation Funding
County Support	Drainage and Special District Initiatives
Soil & Water Conservation District	Private, Community and Landowner Partnerships
State Legislature and Agency Programs	Incentive Zoning and Density Averaging
Highway Improvement Funds	Conservation or Flood Protection Easements

Regular contact with Seneca County Emergency Services, County Highway, the Soil & Water Conservation District and State Legislative representatives are a good way to begin matching your priorities with potential hazard mitigation resources.

Village of Waterloo Hazard Mitigation Projects and Goals

Priorities numbered in order … Contact Seneca County Emergency Services to update, revise and add projects

Status of Projects Identified in the 2008 Plan	Continuing Requirements as of 2018	Updated Cost Estimate 2018
Improvements to the village drainage system	Continues to be an ongoing initiative	$1.5 Million
Implement a tree maintenance program to regularly trim trees and collect debris. Management of tree debris will reduce drain system clogging that contributes to flooding and will prevent losses associated with ice storms and power outages. The program will also include tree planting, emphasizing species that are best resistant to natural hazards.	Continues to be an ongoing initiative	$100,000
Funding Targets: Village resources, Highway and State Legislative grants, SWCD *Project Leadership*: Public Works Superintendent, Mayor, Village Board *Timeline*: Continuous		

Other Work Performed Since 2008
New, larger culvert pipe was installed on William Street and on River Street
A rock storm drain, with clean-out was installed by the old County Hall
Sanitary sewer relining of 8-20 inch pipes was completed on Main Street. This work eliminates sewer system inflow and infiltration to Clark and W. Elizabeth Streets and has reduced drainage time after storms.

Village of Waterloo **Hazard Mitigation Projects and Goals**

New Projects Identified in the 2018 Plan	2018 Cost Estimate
1. Install large drain pipes with catchbasins on Clark Street from Elizabeth to Main Street and parallel along Main Street to Water Street and the Canal. This will improve stormwater management in a 35 acre drainage basin.	TBD
Funding Targets: Village resources, Highway and State Legislative grants *Project Leadership*: Public Works Superintendent, Village Board	*Timeline*: 3-5 yrs

Main Street at Clark, looking east to Water Street

Clark Street to Elizabeth

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Section VII Plan Implementation, Review and Updating

A. Plan Review and Updates

It is the responsibility of the Seneca County Hazard Mitigation Steering Committee, identified in Section II of this Plan, to ensure that a process and resources for evaluating and updating the Multi-Jurisdiction Hazard Mitigation Plan are implemented. Under the leadership of the Chairman of the Seneca County Board of Supervisors, and with the supervision and resources of the County Emergency Management Director, it is the responsibility of the Hazard Mitigation Steering Committee to meet as appropriate and take actions necessary to insure the plan is maintained and updated. The Hazard Mitigation Steering Committee shall meet at least annually, or more often if necessary, to review the status of the plan and any requirements for modifying or updating the plan.

The review of the Multi-Jurisdictional All-Hazard Mitigation Plan shall include an evaluation of the following areas.

- ✓ Reassess the role, influence and success of the Hazard Mitigation Committee; including the composition and participation of its members and the Committee's ability to exercise leadership that leads to implementation of Hazard Mitigation goals and objectives outlined in Section VI.

- ✓ Evaluate the status, progress, problems and schedule associated with each of the Hazard Mitigation goals and objectives

- ✓ Review the role, progress and capabilities of the primary and supporting jurisdictions, agencies and officials responsible for implementing each of the Hazard Mitigation goals and objectives

- ✓ Reassess the hazards, risk and vulnerability assessments included in the plan to determine if changes or modifications are needed. Base the evaluation on new or modified data and information available and changes to existing resources and capabilities

- ✓ Insure that citizen and public participation are incorporated in the planning process, including public involvement in the implementation of project goals, plan updates and modifications

The Hazard Mitigation Committee shall meet at least annually to review and update the plan, but the following situations or conditions will require that the Hazard Mitigation Committee meet more frequently to evaluate plan issues, effectiveness and updates.

- ✓ There are significant changes related to risks, vulnerabilities and capabilities associated with the hazards that are a significant threat for Seneca County

- ✓ There are changes associated with the risks, vulnerabilities and related factors for hazards that were not previously considered relevant, but may now require reevaluation or consideration by the Hazard Mitigation Steering Committee

- ✓ A disaster or emergency occurs and a timely review or evaluation is necessary to determine if hazard mitigation resources would contribute to the disaster recovery; or if elements of the hazard mitigation plan and mitigation goals and objectives included in the plan should be modified based on conditions and circumstances posed by the disaster

- ✓ Problems are identified that impede or threaten timely and successful progress toward implementation of any of the Hazard Mitigation goals and objectives included in Section VI

- ✓ There are changes to key personnel responsible for implementation of hazard mitigation goals and objectives; including those on the Hazard Mitigation Steering Committee and those representing participating jurisdictions and support agencies

- ✓ Grants, funding or resources become available that require immediate action or support by the Hazard Mitigation Steering Committee to insure applicable goals and objectives are addressed.

B. Monitoring Hazard Mitigation Activities

The Seneca County Emergency Management Director is responsible for managing activities and requirements needed to monitor, maintain and update the plan, which includes establishing a process for gathering and collecting information needed to monitor planning maintenance and updates. The Seneca County Emergency Management Director will oversee plan monitoring, data collection and support. Information and recommendations related to plan updates will be provided to the Hazard Mitigation Steering Committee to review the status of the plan and requirements for future plan updates.

In monitoring requirements to review and update the plan, the Hazard Mitigation Steering Committee should work with and seek input from the following officials and representatives or others as appropriate.

Seneca County Board of Supervisors
Seneca County Emergency Management Director
Seneca County Planning and Development Agency
Local Emergency Planning Committee (LEPC)
Village Mayors
Public / Private Sector Leaders
Seneca County Public Health
Seneca County Sheriff
Seneca County Public Works

Municipal Highway and Public Works Superintendents
Seneca County Farm Bureau
Seneca County Soil and Water Conservation District (SWCD)
Seneca County Fire Coordinator
Seneca County Fire Department Chiefs
Seneca County Citizen Corps
Seneca County School Boards and Superintendents
NYS Office of Emergency Management (OEM)
NYS Department of Transportation (DOT)
National Weather Service (NWS)

Hazard Mitigation Plan monitoring should focus on the following issues

- ✓ The status, progress and any problems associated with each of the hazard mitigation goals and objectives included in Section VI
- ✓ Maintain contact and collect information about hazard mitigation goals, objectives and issues from representatives of participating jurisdictions and supporting agencies
- ✓ Monitor information about hazard mitigation resources and funding that can be used to implement hazard mitigation goals and objectives
- ✓ Monitor changes related to risks, vulnerabilities and capabilities associated with hazards relevant or potentially significant to Seneca County
- ✓ Insure that citizen and public participation are incorporated in the planning process, including public involvement in the identification and implementation of project goals, plan updates and modifications

C. Participating Jurisdictions and Agencies

Planning Contact

Each participating jurisdiction, department and agency listed in Section II of this Plan shall provide a representative and actively participate in evaluation and review of the plan. Each jurisdiction, department and agency will maintain a *Primary Planning Contact*, as noted in Section II of this Plan, that is available to provide the local or agency coordination needed to address issues and activity related to the Plan.

The jurisdiction or agency shall also insure that contact information about the current and active representative is maintained with the Seneca County Emergency Management Office and made available to the Hazard Mitigation Steering Committee.

Local Hazard Mitigation Plan Review

-- Monitoring Plan Goals and Objectives --

Each participating municipal jurisdiction shall continuously monitor progress associated with successful implementation of the hazard mitigation goals and objectives identified for their community in *Section VI - Town and Village Hazard Mitigation Goals and Objectives.* Anytime there are significant changes or problems related to implementation of applicable hazard mitigation goals - and at least annually - the jurisdiction will review the status of local goals and projects identified in the plan. The results of the annual or interim reviews; including a summary of any achievements, problems, schedule changes or modifications shall be reported to the Seneca County Emergency Management Office and made available to the Hazard Mitigation Steering Committee.

Towns, Villages and participating agencies should use the two reporting formats on the pages that follow to monitor and update local mitigation goals and projects.

Plan Review and Update Report
New Project Worksheet

These forms should be reviewed and coordinated with the *Primary Hazard Mitigation Planning Contact* for your jurisdiction or agency.

Plan Review and Update Report

The following format can be used to capture and report progress and issues associated with applicable mitigation goals and objectives. This report can be used locally to track mitigation activities and progress and is submitted to the Seneca County Emergency Management Office for briefing the Seneca County Hazard Mitigation Steering Committee.

Seneca County Multi-Jurisdiction Hazard Mitigation Plan *-- Plan Review and Update Report --*	
Jurisdiction:	
Refer to Goals and Objectives listed in Section VI *Town and Village Hazard Mitigation Goals and Objectives*	
Goal and Objective #:	Review Date:
Title or Description:	
Report the status, achievements, problems and modifications associated with the following:	
Description, Definition, Design or Scope of the Project:	
Leadership, Staffing or Assigned Responsibilities for Implementing the Objective:	
Schedules, Milestones, Delays and Target Dates Associated with the Project:	
Issues Related to Project Costs, Budget and Funding:	
Other Indicators of Project Success, Difficulties or Modifications:	
Organizational, Political and Public Concerns or Issues:	
Other Comments, Findings or Requirements:	

Identification of New Projects

The following format can be used to identify new hazard mitigation goals or projects that should be added to the Hazard Mitigation Plan.

Hazard Mitigation – New Project Worksheet
Sponsoring Jurisdiction:
Project Description:
Location(s) - site, road(s), stream, facility, structures, area, etc. - include diagrams, sketches, maps, drawings, if appropriate
Cost Estimate: Low: (less than $100,000 Medium: ($100,000 - $500,000) High: (more than $500,000)
Existing and/or Required Funding Sources:
Attach Documents, Studies, Reports and Data, if available
Lead Agency or Department:
Contact Person (Tel. & email):

Typical hazard mitigation project proposals that appear in mitigation plans statewide include the following. Proposals must generally be cost-effective and environmentally sound.

1. Permanent storm drainage improvements; increased capacity, culverts, pipes, catch basins
2. Permanent solutions for stream-bank erosion, stabilization and protection
3. Structural flood control or protection; such as berms, diversions channels and retention areas
4. Systems for stream debris collection, removal and management
5. Hill and landslide stabilization, bank stabilization, erosion control
6. Installation of back flow valves and flap gates
7. Retrofitting public facilities and private properties; such as elevating buildings above flood elevations, filling-in basements, providing open flow access in structures below flood level, and raising the elevation of electronics, controls, heating and related utilities
8. Acquisition or relocation of public and private properties that remove the structure from a flood hazard area
9. Public education, awareness and notification
10. Communications, security and safety improvements
11. Strengthening floodplain management programs and capabilities
12. Proposals that limit or prevent damage to properties and reduce future insurance claims
13. Development and adoption of local mitigation standards and codes to reduce or eliminate risks
14. Strengthening and amending local codes and ordinances to enhance hazard protection
15. Development of inter-jurisdiction storm water management plans
16. Inter-jurisdiction, shared resource stream debris clearance and maintenance

D. Monitoring Public Participation

Public participation and citizen input are important to a successful hazard mitigation program and vital to the implementation of goals and objectives outlined in the plan. In both annual and interim reports, local jurisdictions should include a review of how citizen participation has been incorporated into local hazard mitigation activities. Factors and considerations related to public participation would include but are not limited to the following.

- Public comments and input documented at local meetings and hearings
- Citizen participation in local forums, workshops and out-reach sessions
- Presentations and briefings provided by local and other public officials
- Meetings with residents during site visits and field work
- Inquiries made by citizens to municipal officials and at municipal offices
- Information posted to and available to the public on websites and related media

E. Revision and Update Schedule

The Multi-Jurisdiction Hazard Mitigation Plan can be updated at any time. Regular updates are recommended to ensure that goals, projects, activities and responsibilities outlined in the plan are current, accurate and applicable.

The Hazard Mitigation Steering Committee and each participating jurisdiction shall review the plan at least annually and that review should include an evaluation of the status and applicability of goals and projects outlined in *Section VI - Town and Village Hazard Mitigation Goals and Objectives.*

The Disaster Mitigation Act of 2000 requires that Hazard Mitigation Plans be updated every five years in order for participating jurisdictions to remain eligible for hazard mitigation project funding. This must be a comprehensive multi-jurisdiction update that follows planning standards required by the Disaster Mitigation Act and FEMA. Annual reviews, or more frequent updates, by the Hazard Mitigation Committee and each participating jurisdiction are necessary to meet basic maintenance standards set forth in this plan, but these local reviews alone will not meet requirements for the five (5) year comprehensive update. The five (5) year comprehensive update can take up to one (1) year to complete, so the Hazard Mitigation Committee will need to begin organizing the update process at least one (1) year in advance.

F. Continuing Public Participation

Public participation, review and input are essential to successful preparation and updating of the Multi- Jurisdiction Hazard Mitigation Plan. Public participation in plan implementation, monitoring and updating will be assured in the following ways.

- The plan is available for public review and comment on the Seneca County website and the Seneca County Emergency Management Office and/or each town and village municipal office.

- The Hazard Mitigation Steering Committee -- working with local elected officials, community leaders and agency representatives -- seeks direct and continuous input, recommendations and participation from citizens, property owners, community and business leaders, organizations and interest groups in the hazard mitigation planning process.

- Annual or interim reports by local jurisdiction representatives should address ongoing public participation activities related to hazard mitigation planning and implementation of hazard mitigation goals and objectives

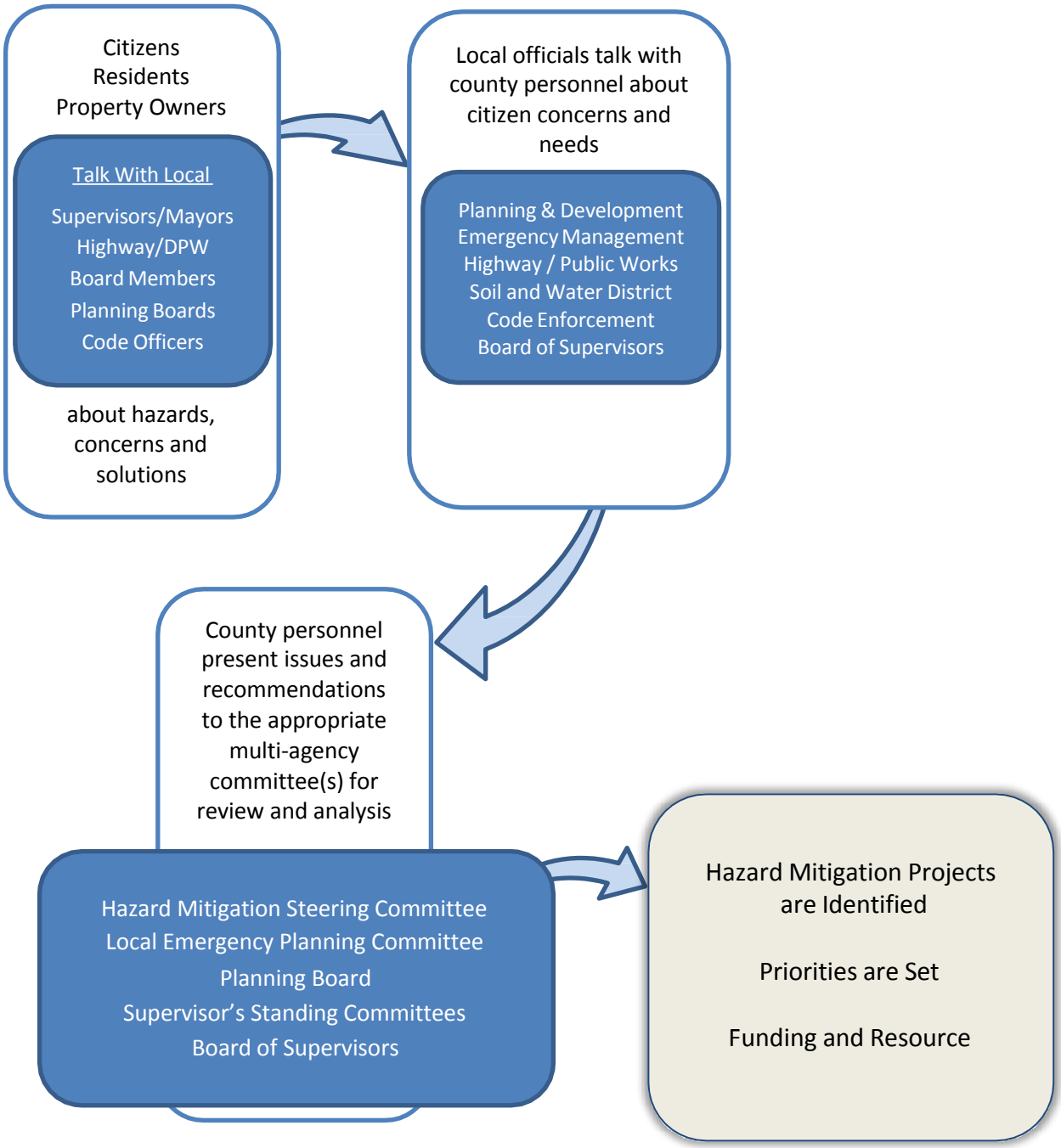
- The best public participation opportunities are often linked with organized citizen groups, panels and boards that have related interest in hazard mitigation and community improvements. The membership of these organizations are typically community volunteers that regularly exchange information about local needs and concerns with a cross-section of people that live and work in Seneca's towns and villages. Local officials should monitor and report on public involvement in meetings and activities sponsored by these and other citizen organizations.

  Seneca County Board of Supervisors
  Seneca County Emergency Management Office
  Seneca County Planning and Development Agency
  Local Emergency Planning Committee (LEPC)
  Public / Private Sector Leaders
  Seneca County Public Health
  Seneca County Sheriff
  Seneca County Public Works
  Municipal Highway and Public Works Superintendents
  Seneca County Farm Bureau
  Seneca County Soil and Water Conservation District (SWCD)
  Seneca County Fire Coordinator
  Seneca County Fire Departments
  Seneca County Citizen Corps
  Seneca County School Boards and Superintendents

As noted in the introduction to this Plan, Seneca County is best known for its sparse population and community-oriented character. Because of the strong community ties and integrated involvement of citizens and leaders among government and civic organizations in the community, ample means and opportunities are available to insure the public is aware of goals set forth in the Hazard Mitigation Plan and that their input and opinions will be heard as the plan is implemented and updated. Those responsible for insuring successful implementation of the Hazard Mitigation Plan – including members of the Hazard Mitigation Steering Committee, agency leaders and local government representatives – are either members of the groups listed above, or they know the leaders and associates of these organizations very well. Further strengthening the lines for feedback and cooperation is the recognition that local elected and government officials in Seneca County, including those responsible for maintaining the hazard mitigation plan, are also members of their local volunteer fire departments, civic and veteran's clubs, school boards and other community interest groups. This kind of integrated community networking and cross-cultural participation provides a valuable and productive platform to promote and sustain public contributions in the hazard mitigation plan. Furthermore, this strategy is aligned with the whole-community approach as outlined in the National Planning Framework (NPF). It is the responsibility of the Hazard Mitigation Steering Committee and the local jurisdiction representatives to insure this kind of comprehensive community involvement and public participation is captured in the annual and interim reports noted above in Part C. (Local Hazard Mitigation Plan Review), so that citizen involvement can be incorporated in plan revisions and updates.

continue to the next page

Continuing Public Participation Strategy



G. Coordination with other Plans and Policies

Implementation of goals and projects outlined in the Multi-Jurisdiction Hazard Mitigation Plan should always insure that proposals remain consistent with objectives and policies established in other local plans. Similarly, when provisions and programs outlined in other local plans and policies are implemented or updated, they should acknowledge and be consistent with objectives and proposals established by the Multi-Jurisdiction Hazard Mitigation Plan.

Coordinating the Local Building Approval Process with Area Development Plans

The planning and implementation of building projects usually begins when a developer or property owner first meets with the Code Enforcement or Zoning Officer to discuss their proposal. It is here that consideration of potential hazards associated with a project and required mitigation should be initiated.

Local building officers will then review development proposals to determine compliance with one or more of the following local land use regulations, where applicable.

Zoning Ordinance	Site Plan Review	Right-to-Farm Law
Subdivision Regulations	Land Management Law	

This review typically includes or leads to discussions about how the development proposal complies with or reflects the goals of various local land use plans and development policies, which may include the following.

Community Comprehensive Pan	Farmland Protection Plan

From this point, some proposals may require a review, approval and public hearing with the municipal Planning Board or Zoning Board of Appeals. During this process, the project is reviewed again to evaluate its compliance with the above local laws, regulations, policies and plans. Certain proposals will also be forwarded to the Seneca County Planning Board for their approval.

There is no specific point where the range of area and regional plans that impact development are considered in reviewing a project proposal – actually, this review should occur at each step of the review process outlined above. It is best when local building officials, planners and community leaders maintain awareness and familiarity with the following county and regional plans and consider their impact on local proposals at each step. In some cases, it may help to a invite a subject area specialist to consult with local officials about the implications of development proposals.

Seneca County Comprehensive Plan
Seneca County Economic Development Plan
Seneca County Environmental Conservation Plan — Seneca County Plans
Seneca County Housing Plan
Seneca County Agriculture and Farmland Protection Plan

Regional Watershed Protection Plans — Cayuga Lake Plan — Seneca Lake Plan

H. Plan Implementation Strategies

The Seneca County Multi-Jurisdiction Hazard Mitigation Plan will be included as an appendix to the County Comprehensive Emergency Management Plan and included as a part of each local emergency response plan.

> Seneca County and each participating jurisdiction should emphasize and include references and links to the *Multi-Jurisdiction Hazard Mitigation Plan* in other local plans and documents where appropriate

Many goals and projects described in the Plan are multi-jurisdictional efforts that will require integrated leadership, planning and resources from several governmental levels and agencies. In these instances, one or two key local representatives often take or share a leadership role, while other interests and participants serve on an existing or ad-hoc team or committee that will guide implementation of the proposal. Other objectives and initiatives included in the plan are specific to a certain municipality or agency, where it is expected that leadership for these targeted objectives would come from the municipality or agency sponsoring the improvement; even though most of these activities still require participation, support and funding from multiple governments and sources.

> It is important that goals, projects and priorities established by the Multi-Jurisdiction Hazard Mitigation Plan be reviewed and considered when the county and local governments prepare annual operating budgets, capital improvement programs, economic development initiatives, land use policies and strategic management plans

Many counties in New York have adopted or they are considering implementation of protocols for capital development and improvements that would require county projects be reviewed for hazard vulnerability, hazard resistant design and site planning. The County could also work with municipal governments to enact similar provisions, including strengthened local codes and standards that encourage hazard resistant design of structures and sites. Such actions could be particularly effective when designing community infrastructure and critical facilities such as government buildings, water and wastewater systems and emergency facilities.

Seneca County will also work with each municipality to encourage that jurisdictions develop a process to ensure hazard vulnerability and mitigation are considered when approving private land-use, zoning and development.

I. Hazard Mitigation Assistance (HMA)

1. Grant and Funding Opportunities

There is a wide-ranging landscape of hazard mitigation funding options that are often complex and challenging to navigate. This plan recommends that local officials begin their funding search by consulting with the following local offices that have information about programs and sources that commonly provide support for the kinds of mitigation projects outlined in this plan.

Seneca County Planning and Development
Seneca County Emergency Services
Seneca County Highway Department
Soil and Water Conservation Service (SWCD)

The most common funding sources used to assist with implementation of the kinds of hazard mitigation projects outlined in this plan include the following, and many mitigation initiatives may incorporate a combination of these opportunities.

Local Budgets	
Local/County resource sharing and in-kind services	
FEMA Hazard Mitigation Grant Programs	(outlined in the section that follows)
U.S. Soil and Water Conservation Service	(contact the local SWCD office)
NYS DEC and DOT local services and support	(contact the Regional offices)
NYS Division of Housing and Community Renewal	(contact through State Legislators)
State Legislative Initiatives	(contact State Legislators)

Links to Funding Sources

There are many references and resources that the contacts above can help with. Another good way to review potential programs and services is to use the links to these and other funding sources available at FEMA.gov

County Emergency Services	Seneca County Emergency Management
County Planning and Development	Seneca County Planning and Community Development
County Highway	Seneca County Highway Department
Soil and Water Conservations District	Soil and Water Conservation District
NYS Hazard Mitigation Program	NYS Hazard Mitigation Program
FEMA	FEMA Hazard Mitigation Assistance
	Hazard Mitigation Grant Program
	Hazard Mitigation Guide for Local Governments
	Eligible Hazard Mitigation Activities

2. FEMA Hazard Mitigation Assistance (HMA)

FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages. As of the date this hazard mitigation plan was prepared FEMA administered the following HMA grant programs:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)

FEMA's HMA grants are provided to eligible applicants (States/Tribes/Territories) that, in turn, provide subgrants to local governments and communities. Applications are received and administered by the State; and then submitted to FEMA for review, consideration and funding. Most grants require a local or non-federal cost share. Prospective applicants should contact the Seneca County Emergency Services Office for further information regarding specific program and application requirements. Also visit the state and federal websites

http://www.dhses.ny.gov/recovery/mitigation/projects.cfm

https://www.fema.gov/mitigation-egrants-system-subapplicant-users

The HMA grant programs provide funding opportunities for pre- and post-disaster mitigation. While the statutory origins of the programs differ, all share the common goal of reducing the risk of loss of life and property due to natural hazards. Brief descriptions of the HMA grant programs can be found below. For more information on the individual programs, or to see information related to a specific Fiscal Year, please click on one of the program links.

Hazard Mitigation Grant Program (HMGP) HMGP assists in implementing long-term hazard mitigation measures following Presidential disaster declarations.

Pre-Disaster Mitigation (PDM) PDM provides funds on an annual basis for hazard mitigation planning and the implementation of mitigation projects prior to a disaster. The goal of the PDM program is to reduce overall risk to the population and structures, while at the same time reducing reliance on federal disaster funding.

Flood Mitigation Assistance (FMA) FMA provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program (NFIP).

Repetitive Flood Claims (RFC) RFC provides funds on an annual basis to reduce the risk of flood damage to individual properties insured under the NFIP that have had one or more claim payments for flood damages. RFC provides up to 100% federal funding for projects in communities that meet the reduced capacity requirements.

Severe Repetitive Loss (SRL) SRL provides funds on an annual basis to reduce the risk of flood damage to qualified residential structures insured under the NFIP. SRL provides up to 90% federal funding for eligible projects.

3. Hazard Mitigation Assistance (HMA) -- Project Eligibility

The HMA Mitigation Activity Eligibility chart lists eligible mitigation activity types for the HMA grant programs, as of September 2009. A checked box (√) indicates activity eligibility under a program. A grayed box indicates activity ineligibility under a program. Submission of an eligible activity type does not guarantee an award by FEMA.

HMA Mitigation Activity Eligibility

Eligible Activities	HMGP	PDM	FMA	RFC	SRL
Mitigation Projects	√	√	√	√	√
Property Acquisition and Structure Demolition	√	√	√	√	√
Property Acquisition and Structure Relocation	√	√	√	√	√
Structure Elevation	√	√	√	√	√
Mitigation Reconstruction					√
Dry Floodproofing of Historic Residential Structures	√	√	√	√	√
Dry Floodproofing of Non-residential Structures	√	√	√	√	
Minor Localized Flood Reduction Projects	√	√	√	√	√
Structural Retrofitting of Existing Buildings	√	√			
Non-Structural Retrofitting of Existing Buildings and Facilities	√	√			
Safe Room Construction	√	√			
Infrastructure Retrofit	√	√			
Eligible Activities	HMGP	PDM	FMA	RFC	SRL
Soil Stabilization	√	√			
Wildfire Mitigation	√	√			
Post-disaster Code Enforcement	√				
5% Initiative Projects	√				
2. Hazard Mitigation Planning	√	√	√		
3. Management Costs	√	√	√	√	√

Appendix 1

List of Acronyms	
Acronym	**Description**
AAR/IP	After Action Report/Improvement Plan
ACS	American Community Survey
ARC	American Red Cross
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosive
CBS	Chemical Bulk Storage
CEMP	Comprehensive Emergency Management Plan
CRS	Community Rating System
DHS	Department of Homeland Security
DMA	Disaster Mitigation Act
DPW	Department of Public Works
EA	Engineering Assessment
EAP	Emergency Action Plan
ECL	Environmental Conservation law
EIA	Energy Information Administration
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESD	Empire State Development
FASNY	Firefighters Association of New York
FD	Fire Department
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FMA	Flood Mitigation Assistance
GIS	Geographical Information System
HAZNY	Hazard Analysis – New York
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HMPC	Hazard Mitigation Planning Committee
HUD	Housing and Urban Development
ICS	Incident Command System
IDA	Industrial Development Agency
IED	Improvised Explosive Device
IND	Improvised Nuclear Device
JCAHO	Joint Commission on the Accreditation of Healthcare Organizations
LEPC	Local Emergency Planning Committee

MMI	Modified Mercalli Intensity
MOSF	Major Oil Storage Facility
MPH	Miles Per Hour
MSA	Metropolitan Statistical Area
NCDC	National Climate Data Center
NFIP	National Flood Insurance Program
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NPF	National Planning Framework
NRC	National Response Center
NWS	National Weather Service
NYCRR	New York Codes, Rules and Regulations
NYPA	New York Power Authority
NYS	New York State
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
NYSEG	New York State Electric and Gas
NYSGS	New York State Geological Survey
NYSOEM	New York State Office of Emergency Management
NYSP	New York State Police
NYSPSC	New York State Public Service Commission
PBS	Petroleum Bulk Storage
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
PG&E	Pacific Gas and Electric
RLC	Repetitive Loss Claims
RLP	Repetitive Loss Properties
SA	Spectral Acceleration
SARA	Superfund Amendments and Reauthorization Act
S.A.V.E.	Safe Schools Against Violence in Education
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, Environmental
SRLP	Severe Repetitive Loss Property
SRL	Severe Repetitive Loss
SUNY	State University of New York
THIRA	Threat and Hazard Identification and Risk Assessment
US	United States
USGS	United States Geological Survey

Appendix 2 Hazard Mitigation Organizing Documents

1. Hazard Mitigation Project Planning Notes

   Seneca HM Project Planning

2. Local Project Organizing Letter

   Organization Letter Municipalities

3. Local Officials Briefing Handouts

   Highway Briefing

4. Local Workshops Invitation and Preparation

   Seneca County Hazard Mitigation

5. Hazard Mitigation Projects Worksheet

   Seneca HM Projects Worksheet

6. Hazard Analysis (HAZNY) Workshop Announcement

   HAZNY Announcement Seneca

7. Draft Proposals Review

   Draft projects

Appendix 3 Local Adoption Resolutions
Seneca County Hazard Mitigation Plan

Date, 2017

To: Seneca County Supervisors, Village Mayors and Municipal Clerks

From: Seneca County Emergency Management Office

Re: **Local Adoption of the Multi-Jurisdiction Hazard Mitigation Plan**

The 2017 update of the *Seneca County Multi-Jurisdiction Hazard Mitigation Plan* has been completed and FEMA is prepared to grant final approval of the plan once it has been formally adopted by your jurisdiction and other participating local governments.

The adoption by a resolution of the local board in each participating town and village is necessary to obtain final FEMA approval of the plan, which then makes your community eligible to apply for mitigation project grant funding. We encourage each local board to act on formal adoption of the plan at an upcoming meeting.

I am attaching a sample resolution you can use for local board adoption. It is strongly recommended that you use this format, since it reflects specific requirements and emphasis important for FEMA approval. Key items FEMA looks for on the adoption document are the signature (certification), date; and the language (as excerpted from attached sample), "the town/village adopts the county plan as the jurisdiction's plan", and "that citizens have had an opportunity to comment and provide input on the plan" -- which we already demonstrated to FEMA's satisfaction.

Please forward the approved resolutions to this office as soon as possible. Thank you for your participation and support in our important work to update and implement goals set forth in the Multi-Jurisdiction Hazard Mitigation Plan.

As always, if you have any questions, please feel free to contact this office.

Sincerely,

Sample Adoption Resolution

(Name of Jurisdiction) _____

(Governing Body) _____

(Address) _____

RESOLUTION

WHEREAS, *(Insert name of Jurisdiction*), with assistance from the Seneca County Emergency Management Office, has gathered information and assisted with the preparation of the *Seneca County Multi-Jurisdiction Hazard Mitigation Plan*; and

WHEREAS, the *Seneca County Multi-Jurisdiction Hazard Mitigation Plan* has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, *(Insert name of Jurisdiction*) is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, *(Insert the name of the governing body)* has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by *(Insert the name of the governing body)* that *(Insert name of Jurisdiction*) adopts the *Seneca County Multi-Jurisdiction Hazard Mitigation Plan* as this jurisdiction's All Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this_____day of_____, 2017 at the meeting of the *(Insert the name of the governing body).*

Results of Vote _____Yes _____No

_____Municipal Clerk

_____Date

Note: If preferred, local governments can use their own letterhead, format or other local content that is consistent with the language and provisions contained in this sample adopting resolution.