Multi-Jurisdictional
Hazard Mitigation Plan

Oswego County, New York

Revised September 2012

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This plan was compiled by the Oswego County Emergency Management Office and Barton & Loguidice, P.C. All jurisdictions within Oswego County were invited to participate in this planning process. A special thanks to the representatives from each participating jurisdiction for their time and effort to this project and to Terry Bennett for her unlimited dedication to the completion of this plan.

Cover photo: Courtesy of Oswego County Today

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1.0 Introduction

1.1 Background

The Federal Emergency Management Agency (FEMA) provides assistance through the Robert T. Stafford Disaster Relief and Emergency Assistance Act to local governments that are recovering from a hazard event. A hazard is defined as a situation which poses a level of threat to life, health, property, and/or the environment. Mitigation planning involves the execution of short-term and long-term actions which work to alleviate the potential threat and/or effects of certain hazards. The Federal Disaster Mitigation Act of 2000 (DMA 2000), placed new emphasis on the importance of local mitigation planning. The new regulations established by DMA 2000 (Section 322 and 44 CFR Part 201) specify that local governments must have a FEMA approved mitigation plan in order to be eligible to receive project funding.

DMA 2000 encourages and rewards local and state pre-disaster planning, promotes sustainability, and seeks to integrate state and local planning with an overall goal of strengthening statewide hazard mitigation planning. This enhanced planning approach enables local, tribal, and state governments to articulate accurate and specific needs for hazard mitigation, which results in faster, more efficient allocation of funding and more effective risk reduction projects. As of November 1, 2004, all local governments were required to have a FEMA approved hazard mitigation plan in order to receive funding through the Hazard Mitigation Grant Program (HMGP) for specified mitigation projects. To meet the federal requirements of the Disaster Mitigation Act of 2000, Oswego County has been awarded a Pre-Disaster Hazard Mitigation Grant to establish a multi-jurisdictional, multi-hazard county mitigation plan.

1.2 Purpose

This plan signifies Oswego County's approach to the development of a Multi-Jurisdictional Hazard Mitigation Plan in order to seek mitigation funding in the future to alleviate the potential effects of natural, human caused and technological disasters and hazards that may affect the County. Each

participating jurisdiction, in addition to the County as a whole, has identified the hazards to which their community is most vulnerable. In addition, the mitigation plan also includes an assessment of the risks and vulnerabilities associated with each hazard and details mitigation strategies to moderate those vulnerabilities and decrease the risks. At a minimum, the identified mitigation measures were required to be technically feasible, cost-effective, and environmentally sound.

Within Oswego County, the Emergency Management Office (EMO) is the coordinating agency for all emergency management activities. This office is responsible for life safety, property, and environmental protection from all natural and technological hazards that may occur within Oswego County. The development of a County hazard mitigation plan provides the following benefits:

- Increased understanding of the natural hazards the County faces;
- Development of more sustainable and disaster-resistant communities;
- Partnerships that support planning and mitigation efforts;
- Reduced long-term impacts to structures and human health; and
- Eligibility for Federal funds for pre-disaster mitigation planning (DMA 2000).
- Comments or questions concerning this document should be addressed to the Oswego County Emergency Management Office at the Oswego County Branch Building, 200 North Second Street, Fulton, New York 13069. The telephone number for this office is (315) 591-9150.

For additional information on Oswego County's mitigation planning process or the County's Emergency Management Office, please visit their website at: www.co.oswego.ny.us/emo/hazard.

1.3 Hazard Mitigation Process

1.3.1 Jurisdiction Participation

There are 22 towns, 10 villages, and 2 cities located within Oswego County. Each one of these jurisdictions was invited to participate in the assemblance of this plan. Each jurisdiction was provided multiple letters inviting them to participate in this process. Regardless of these efforts, and additional coordination through the County's Emergency Management Office, four (4) jurisdictions chose not to participate in this plan. To EMO's knowledge, none of these four jurisdictions have plans to complete single jurisdiction hazard mitigation plans. Participation criteria were established by the Executive Committee early on in plan progression. Table 1 outlines the criteria that had to be met in order for a jurisdiction to be included as a participating member of the County's hazard mitigation plan.

Table 1 – Participation Criteria Chart	
Criterion	**How to meet**
Jurisdiction representation at working group meetings	Attend minimum of 2 working group meetings
Jurisdiction completed and participated in working group exercises	Completed a minimum of 2 hazard identification and assessment exercises
Jurisdiction participated in hazard mitigation discussions and brainstorming activities	Jurisdiction identified hazard mitigation activities specific to their area
Jurisdiction representatives reviewed and commented on draft plan	Provide comments to County EMO
Jurisdiction assisted with public review of the plan	Linked plan to local website, emailed plan to interested citizens, advertised public location of plan in jurisdiction
Jurisdiction agreed to pass resolution to adopt hazard mitigation plan	Example of resolution is provided in Appendix A. These resolutions will be passed and included in the plan as part of FEMA's formal review.

The study area for Oswego County's Multi-Jurisdictional Hazard Mitigation Plan includes the following participating jurisdictions: Towns of Albion, Amboy, Boylston, Constantia, Granby, Hannibal, Hastings, Mexico, New Haven, Orwell, Oswego, Parish, Redfield, Richland, Sandy Creek, Scriba, Volney, West Monroe, and Williamstown – Villages of Altmar, Central Square, Cleveland, Hannibal, Lacona, Mexico, Parish, Pulaski, and Sandy Creek – Cities Fulton and Oswego. The four non-participating jurisdictions are Towns of Minetto, Palermo and Schroeppel, and the Village of Phoenix. Refer to the following Figure 1.1 to locate the participating and non-participating jurisdictions within Oswego County.

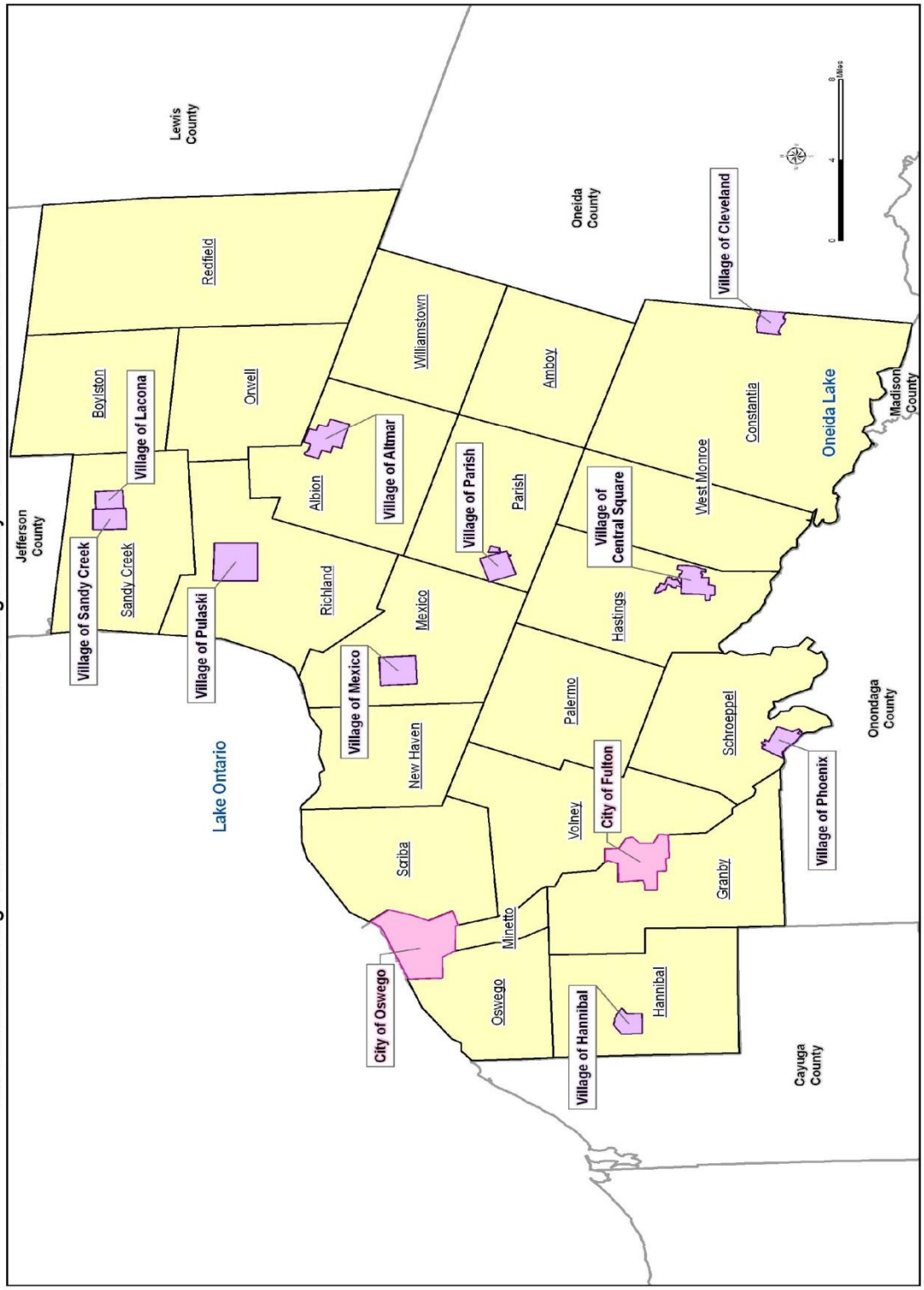


Figure 1.1 - Shows the Towns, Villages, and Cities that comprise Oswego County. The Counties and large water bodies that border Oswego County are also labeled for reference.

The County was geographically split into three working groups in order to assemble areas that experienced similar hazard concerns and to allow for easier jurisdiction participation. The Northern Working Group is comprised of the Towns of Albion, Boylston, Orwell, Richland, Redfield, Williamstown, and Sandy Creek, and the Villages of Sandy Creek, Pulaski, Altmar, and Lacona. The Central Working Group is comprised of the Towns of Hastings, Parish, Mexico, Constantia, Amboy, New Haven, and West Monroe, and the Villages of Cleveland, Mexico, Parish, and Central Square. The Southern Working Group is comprised of the Towns of Granby, Hannibal, Volney, Scriba, and Oswego, the Village of Hannibal, and the Cities of Fulton and Oswego. Figure 1.2 shows the participating and non-participating jurisdictions and their geographical working groups.

Each working group met on a flexible every 3-week schedule. The Southern Working Group (SWG) predominantly met at the County Sheriff's Department at the Public Safety Center, located at 39 Churchill Road, Oswego. The Central Working Group (CWG) predominantly met at the Hastings Town Hall, 1134 U.S. Route 11, Central Square; and the Northern Working Group (NWG) regularly met at the Snow Memorial Building, 4917 Jefferson Street, Pulaski. These three meeting locations represented centralized locations for each working group. More detailed information regarding each working group's meetings, participants, and outcomes is outlined in Section 3.0.

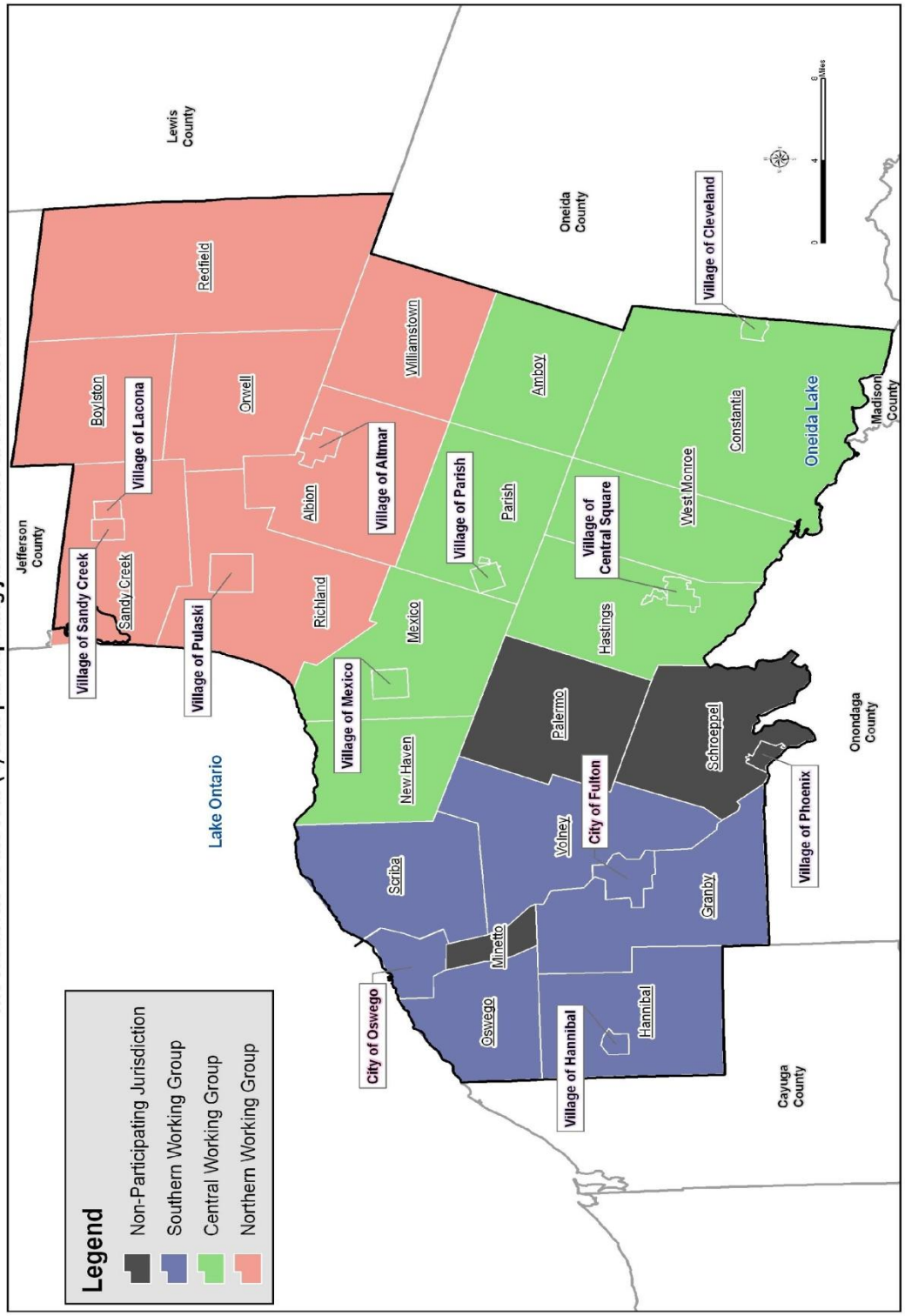


Figure 1.2 - This figure depicts the jurisdictions included in each of the three geographical working groups. The locations of the four (4) non-participating jurisdictions are also shown.

1.3.2 Executive Committee

An eight person Executive Committee was established to discuss the startup and implementation of the hazard mitigation project and to make ultimate decisions, when required, throughout the planning process. Executive Committee members and their affiliations are as follows:

- Pat Egan – Director, Oswego County Emergency Management Office
- Terry Bennett – Program Coordinator, Oswego County Emergency Management Office
- Paul Santore – Oswego County Legislature, District No. 16 and Chairman of the Public Safety Committee (2009)
- Linda Lockwood – Oswego County Legislature, District No. 11 and Chairwoman of the Public Safety Committee (2010)
- Dave Turner – Director, Oswego County Department of Community Development, Tourism and Planning
- Ronald Raymond – Disaster Preparedness Representative, New York State Office of Emergency Management, Region IV
- Kelly Jordal – Public Information Officer, Oswego County Department of Community Development, Tourism and Planning
- John Condino – Senior Project Manager, Barton & Loguidice, P.C.
- Johanna Duffy – Environmental Scientist, Barton & Loguidice, P.C.

1.3.3 County HIRA-NY Analysis

A hazard analysis using the program Hazard Identification and Risk Assessment (HIRA or HIRA-NY) was completed on May 29, 2009. This event updated the County's previous hazard analysis that was conducted in 2000. Aside from Oswego County personnel, representatives from many other State and local organizations, agencies, and businesses were present to participate in this event. A complete participation list, including individuals and their affiliations, is included in Section 4.1.

HIRA-NY is an automated program that was developed by the American Red Cross and the NYS Office of Emergency Management (NYSOEM), formerly the NYS Emergency Management Office (NYSEMO), to analyze the types of hazards, natural, human-caused, and technological, that may impact an area and to specify details such as the longevity, severity, frequency, etc. of such hazard events. This hazard analysis forms the basis for the County's risk and vulnerability assessment. Aside from Oswego County, 19 other participating jurisdictions have completed individual hazard analyses with assistance from the Oswego County Emergency Management Office to determine their hazard vulnerabilities. All completed analyses are included in Appendix B. Guidelines related to the execution of the HIRA-NY program and hazard analysis process are included in Appendix C.

HIRA-NY evaluates five (5) factors related to the hazard analysis process:

- *Scope* – looks at areas that could be impacted by the hazard and whether this hazard could trigger another hazard causing a cascade effect;

- *Onset* – looks at how much time there is between when a hazard is identified and when it begins to impact a community;
- *Impact* – looks at the extent that an area's infrastructure, private property, and people would be impacted from a hazard event;
- *Duration* – looks at how long the hazard remains active, how long it takes emergency operations to continue after the occurrence of a hazard, and how long the recovery process takes; and
- *Frequency* – looks at how often a particular hazard has occurred, the severity of these occurrences, and the probability of future occurrences. Historical events are documented and researched to aid in this analysis.

During this analysis, the County determined that some of the natural and technological hazards included in the HIRA-NY program were not applicable to Oswego County. Therefore, only a total of 20 natural and technological hazards, included as part of the HIRA-NY analysis, were evaluated by County personnel and agency representatives participating in the event. The group analyzed all hazards determined to potentially affect Oswego County. HIRA-NY rated each hazard based on the group's assessment for each hazard related to the frequency, magnitude, extent, potential for direct and/or cascading effects, historic occurrences and damage estimates, and vulnerable populations, property, and structures. The selected hazards were categorized as follows:

Rating of 321 to 400 = High Hazard
Rating of 241 to 320 = Moderately High Hazard
Rating of 161 to 240 = Moderately Low Hazard
Rating of 44 to 160 = Low Hazard

The 20 hazards that were identified as a result of this exercise are listed below in Table 2, along with their associated HIRA-NY ratings and categories.

Table 2 – Oswego County HIRA-NY Program Rating Results
This table lists the hazards analyzed by Oswego County during their HIRA-NY 2009 revision event. The ratings that are assigned each hazard by the HIRA-NY program are also included in the table (Oswego County, HIRA-NY, 2009).

Hazard	HIRA-NY Numerical Rating	HIRA-NY Category
Severe Storm	289	Moderately High
Ice Storm	257	Moderately High
Utility Failure	254	Moderately High
Earthquake	246	Moderately High
Hazmat (in transit)	242	Moderately High
Terrorism	29	Moderately Low
Tornado	237	Moderately Low
Flood	234	Moderately Low
Dam Failure	232	Moderately Low
Fire	223	Moderately Low
Wildfire	217	Moderately Low
Winter Storm (severe)	208	Moderately Low
Epidemic	204	Moderately Low
Hazmat (fixed site)	204	Moderately Low
Ice Jam	204	Moderately Low
Coastal Storm	203	Moderately Low
Extreme Temperatures	190	Moderately Low
Landslide	171	Moderately Low
Drought	164	Moderately Low
Radiological (fixed site)	145	Low

Detailed profiles of these 20 hazards are included in Section 6 of this plan.

1.4 Plan Organization

The Oswego County Hazard Mitigation Plan includes a community profile, a hazard ranking and assessment, vulnerability determination and analyses, and an implementation and monitoring section. Each participating jurisdiction identified the hazards that their community was most vulnerable to, estimated potential losses from each applicable hazard, and offered strategies to mitigate the potential losses and damage that these hazards could cause. These hazards and strategies are all included in the County's overall Multi-Jurisdictional Hazard Mitigation Plan.

1.5 Incorporated Resources

Many existing resources, plans, and studies were incorporated into Oswego County's Hazard Mitigation Plan and/or reviewed as part of the planning process. The resources used to provide information and guidance on the completion of the hazard mitigation process include:

- FEMA – Part 1 Natural Hazard, Subpart A Atmospheric Hazards from Multi-Hazard Identification and Risk Assessment (MHIRA)
- FEMA – Part 1 Natural Hazard, Subpart E Other Natural Hazards for MHIRA
- FEMA – Multi-Jurisdictional Mitigation Planning (FEMA 386-8) – How-To Guides
- FEMA – Local Multi-Hazard Mitigation Planning Guidance
- NYSOEM – NYS Hazard Mitigation Plan
- Oswego County – Comprehensive Plan
- Oswego County – Comprehensive Emergency Management Plan
- Oswego County – Local Solid Waste Management Plan

- Oswego County – Visitor's Guide
- Oswego County – Development Regulation Guide
- Oswego County – Land Use Regulations 2007
- Oswego County Environmental Management Council – 2009 State of the Environment and Annual Report
- Town of Amboy – Comprehensive Plan
- Town of Constantia – Comprehensive Plan
- Town of Parish – Comprehensive Plan

2.0 Oswego County Profile

This section details the existing environmental features, transportation networks, demographics, history, and available facilities within Oswego County.

2.1 Geographic Location

Oswego County is located in northwestern New York State, just north of Syracuse and not far south of Watertown. Figure 2.1 shows the location of Oswego County within New York State. The eastern shore of Lake Ontario borders the County to the west and the north shore of Oneida Lake borders the southeastern portion of the County to the south. The eastern part of the County includes part of the Tug Hill Plateau, the northeast corner of which registers as the highest point in Oswego County at 1550-feet above mean sea level (msl). The following Towns and Villages are included wholly or partially within the Tug Hill Region: Towns of Boylston, Orwell, Redfield, Albion, Williamstown, Parish, Amboy, Hastings, West Monroe, and Constantia, and the Villages of Parish, Altmar, Cleveland, and Central Square (Tug Hill Commission, GIS Services, Regional Map). Figure 2.2 illustrates the multi-county area included as part of the Tug Hill Region, including the eastern portion of Oswego County.

Oswego County has a total area of 1,312 square miles, of which, 953 square miles are land and 359 square miles are water (U.S. Census Bureau, American Fact Finder, 2008). Figure 2.3 illustrates the topographic relief of Oswego County and the locations of major water bodies within and adjacent to the County limits.

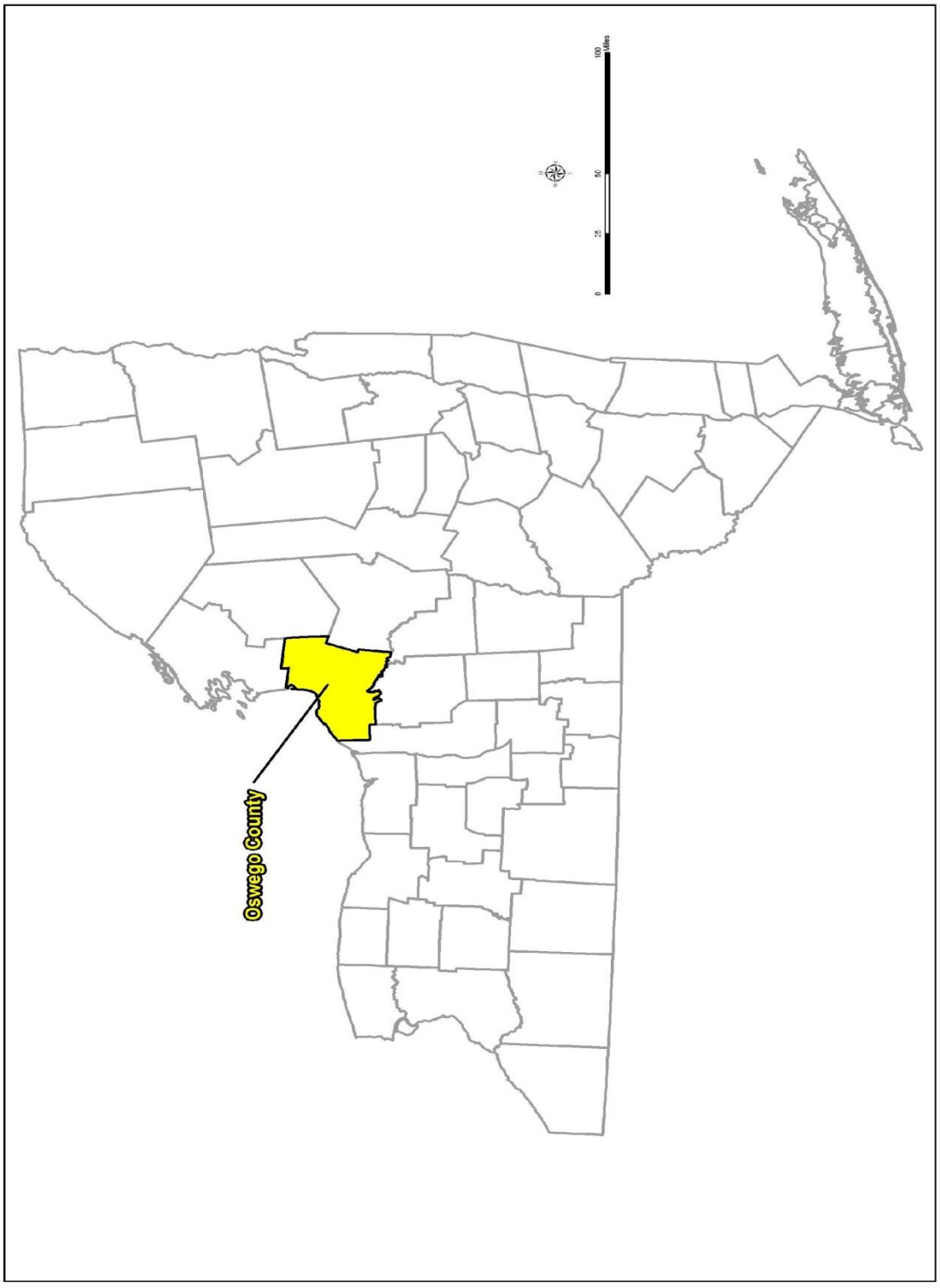
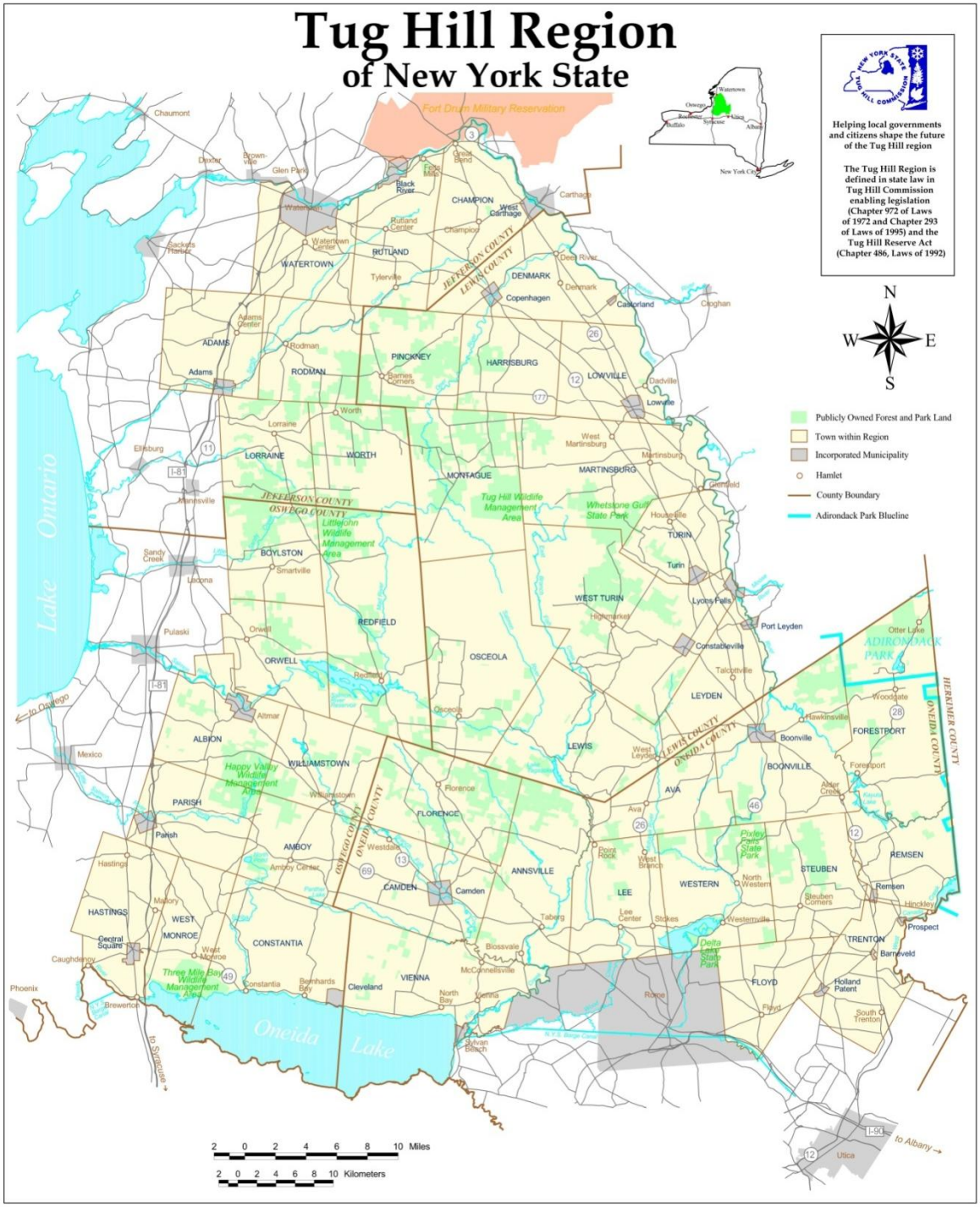


Figure 2.1 - This figure depicts the location of Oswego County in relation to all other Counties included in New York State.

Figure 2.2 – This figure depicts the Tug Hill Region, which includes multiple jurisdictions located within Oswego County, as shown.



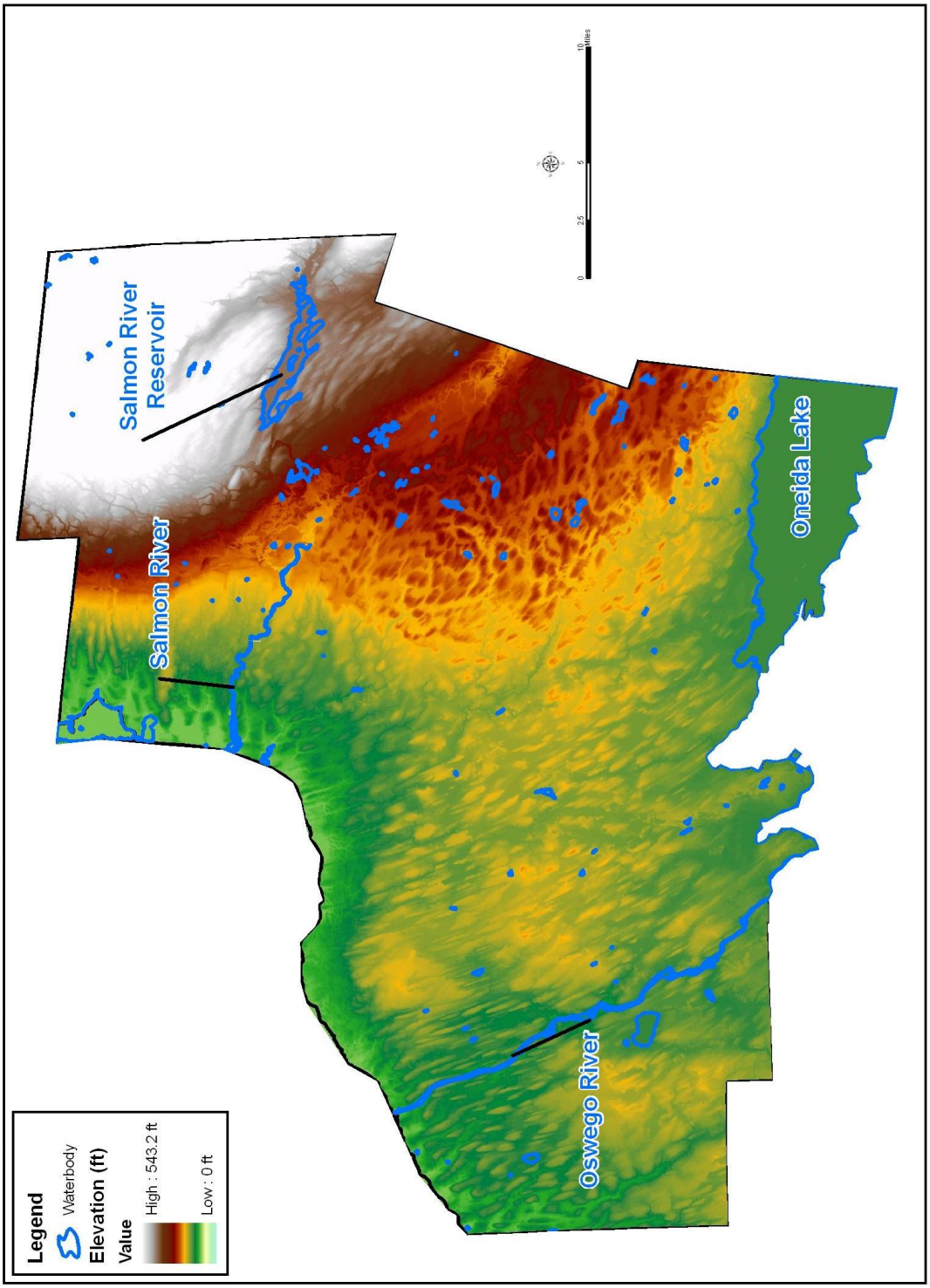


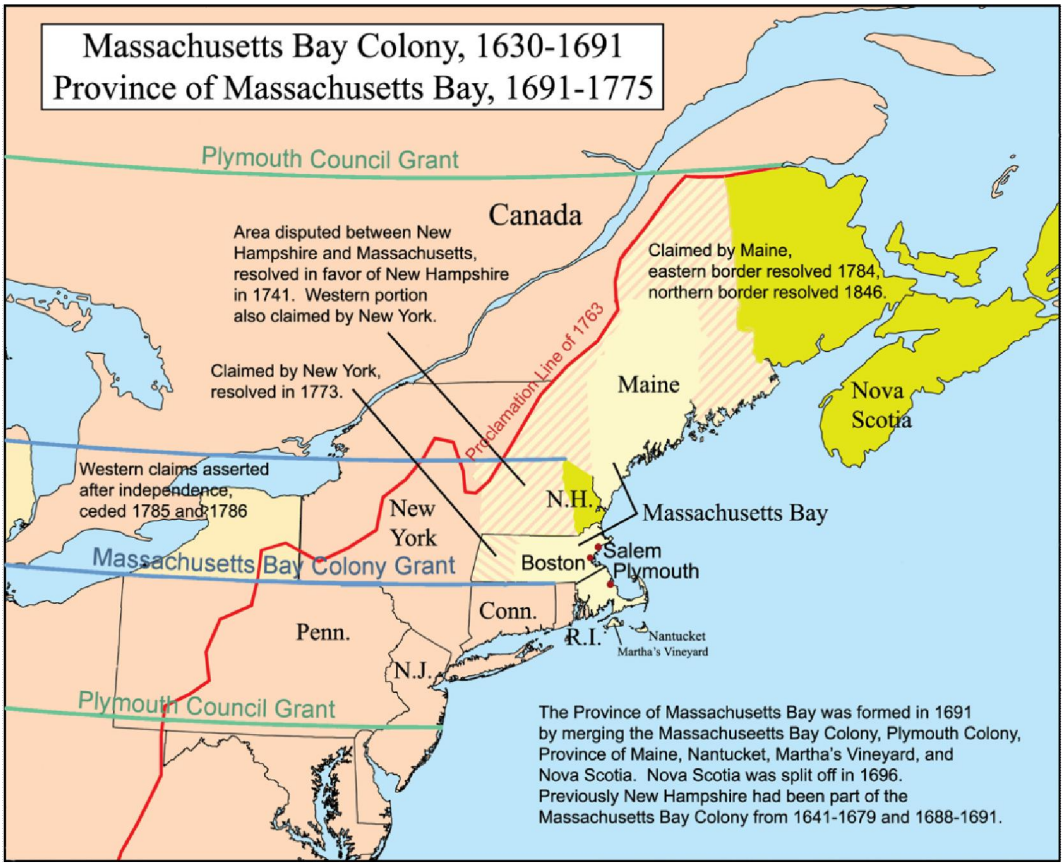
Figure 2.3 - This figure depicts the overall topography of Oswego County. The Tug Hill Region is clearly defined in the northeastern section of the County. Locations of major water bodies within the County are also shown on this figure.

2.2 Historical Overview

According to the Oswego County Comprehensive Plan (2007), the first inhabitants of the Oswego County area were pre-Iroquoian indigenous peoples who used the land primarily for hunting and fishing. The first white explorers to the area were French missionaries and Dutch fur traders.

Oswego County was originally created by the New York State Legislature in 1816. According to the Oswego County Clerk Office's website, prior to 1816, the lands included within the present day Oswego County were part of the Massachusetts Bay Colony Grant of 1629. Figure 2.2.1 shows the land area that was originally included in the Massachusetts Bay Colony Grant (Wikimedia Foundation, Inc., Kmusser, January 2008).

Figure 2.4 – This figure shows the Province of Massachusetts Bay, which was formed in 1691 from the Massachusetts Bay Colony and other adjacent lands and colonies.



Prior to the Revolutionary War, the British had a stronghold in the Region which primarily revolved around trade. In order to protect their trade interests, three British forts were constructed along the east and west banks of the Oswego River, at the port City of Oswego. Fort Oswego was initially constructed as a trading post in 1722 on the west bank of the river near First and Lake Streets. Completion of a stone wall around the perimeter of the Fort was completed in 1727. The Forts of Ontario and George were completed in 1755, Ontario on the east side of the river and George on the west. All three forts were destroyed by 5,000 French and Indians on August 14, 1755, during the beginning years of the French and Indian War (often included as part of the larger conflict known as the Seven Years' War). Only Fort Ontario was re-built after being destroyed; this occurred in 1756 (New York State Division of Military and Naval Affairs: Military History, 2006). In 1778, the second Fort Ontario was destroyed by American troops based at Fort Stanwix in the City of Rome, Madison County. Even though the British subsequently surrendered in Yorktown in 1781 and signed the Treaty of Paris in 1783, they re-built Fort Ontario for a third time and occupied it until the fort was turned over to the United States in 1796 (A Revolutionary Day, 2001).

Oswego County was an area of significance in the War of 1812. Fort Ontario fell back into the hands of the British during this war, until the Fort was again taken over by the United States in 1838. The current Fort Ontario was constructed between 1839 and 1844. This site was used as an Army Post in 1903 and an emergency refugee center for victims of the Holocaust during World War II. In 1949, Fort Ontario became a New York State Historic Site (A Revolutionary Day, 2001).

Figure 2.5 – This figure shows a 2006 orthoimage of the current Fort Ontario, located in the City of Oswego along the east bank of the Oswego River.

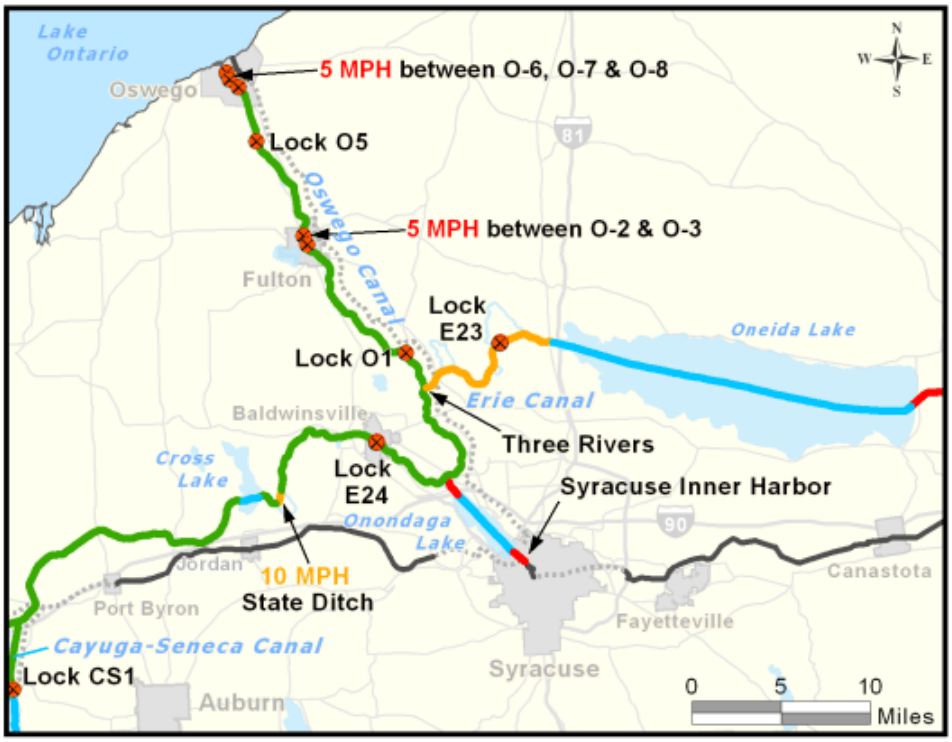
Settlement within Oswego County began to sharply increase after the conclusion of the War of 1812. The largest factor leading to the increase in settlement is attributed to the completion of the Oswego Canal in 1828. The construction of this branch of the canal system ensured that the Oswego River remained an important waterway for transportation and the shipment and trade of goods. The Oswego Canal is 24-miles in length and connects the portion of the Erie Canal near Syracuse with Lake Ontario (Welcome to NY Canals, 2006-2009). The construction of the canal allowed for more cost effective and faster transportation for people and goods. As a result of the economic opportunity, the population within the City of Oswego doubled between 1820 and 1830 (Oswego County Comprehensive Plan, 2007).

The two cities located in Oswego County exhibit the largest population densities and greatest diversity of commercial and residential land uses. The City of Fulton was renamed such in 1826, after being referred to as “Quehok” by

Native Americans and “Oswego Falls” by early settlers. The closeness of the Oswego River attracted numerous grist, lumber, wool, and silk mills to Fulton. The City of Oswego receives its name from a Native American word Osh-we-geh, which means pouring out place (Crowder Associates, 1997-2009). Since Oswego is located where the Oswego River enters the southern shore of Lake Ontario, this City has always been an important hub for the shipping industry, often serving as a popular stopping location for ships carrying goods to the Midwest via Lake Ontario.

Oswego County is one of three Counties in New York State that historically had two County seats, one in the City of Oswego and one in the Village of Pulaski. The law at the time of the first Board of Supervisors meeting, held in 1816, provided for two jury districts, with a County seat and court house in each district. After numerous complications from having two seats, a permanent County seat was designated in the City of Oswego by an Act of the Legislature and vote of Supervisors in 1852. Though court is still sometimes held in the Village of Pulaski, the County records since 1852 have been kept in the County clerk’s office in the City of Oswego (Oswego County Clerk, 2009).

Figure 2.6 – This figure shows the location of the Oswego Canal in relation to the locations of other canal system segments and important Cities and Villages located along important canal routes. Image taken from www.nyscanals.gov



The lands west of the Oswego River, which included the current Towns of Oswego, Hannibal, Granby, and Minetto, were referred to as the Military Tract. These areas were divided into land parcels and distributed freely to Revolutionary War veterans. This land was initially obtained by the State of New York through a series of treaties with the Iroquois Indians (Oswego County Comprehensive Plan, 2007). In 1792, the current Towns of Constantia, West Monroe, Amboy, Parish, Hastings, Schroeppel, Palermo, and Volney were part of a 525,000 acre land purchase by George Scriba and other associates, termed the Scriba Patent South. This southern area of the County was settled earlier than the northern portions of the County due to the locations of natural waterways and transportation infrastructure. In 1846, the first plank road in the United States, now titled U.S Route 11, was constructed, connecting the City of Syracuse to the Village of Central Square (Oswego County Comprehensive Plan, 2007). This roadway has since been expanded to terminate in the City of Watertown in Jefferson County.

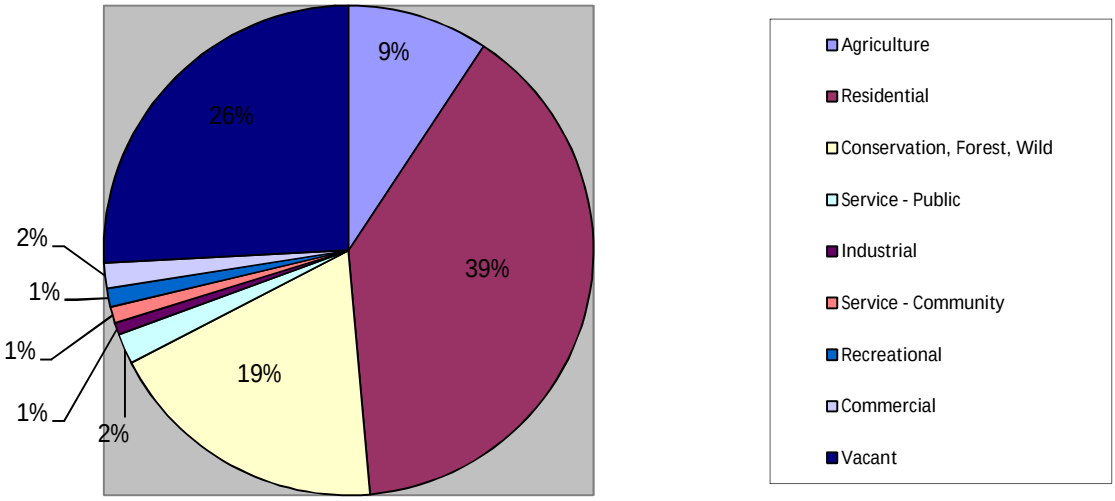
George Scriba's land purchase, Scriba Patent North, also included areas further north in Oswego County, now recognized as the Towns of Scriba, New Haven, Mexico, Williamstown, and the southern portions of Richland and Albion. Many of these Towns and their Villages began as important mill areas since there were multiple waterways with which to power such facilities. The remaining Towns in northern Oswego County, the Towns of Redfield, Orwell, Boylston, Sandy Creek, and the northern portions of Richland and Albion, comprised a multi-million-acre tract of land that was sold by New York State in 1791 to several land speculators. Eventually these large areas were divided and sold to settlers as manageable sized tracts of land, primarily used for lumber operations and dairy farming.

Following World War II, many of the industries and activities that jump started the economy and settlement within Oswego County has declined. Today, Oswego County is home to a handful of expanding industries like education, health services, and nuclear energy; the fluctuations in County-wide populations are primarily related to suburbanization within the County (Oswego County Comprehensive Plan, 2007).

2.3 Land Use

Land use within Oswego County is primarily residential and rural. Areas of disturbance are attributed to residential areas and those associated with active agricultural uses, primarily row cropping and hay production. Numerous freshwater wetlands are also located within Oswego County, attributed to the fact that the County is located along the eastern shore of Lake Ontario and that much of the County is therefore associated with the Lake plain. The general land uses classified throughout the County are shown on Figure 2.8. Figure 2.7 depicts the 2007 percentages of different land uses within Oswego County.

Figure 2.7 - Shows 2007 Land Use Percentages Within Oswego County
(Oswego County Comprehensive Plan)



Areas of high residential intensity are located solely in the Villages and Cities within the County, the highest densities being observed within the City of Oswego and the City of Fulton. A housing unit is determined to be occupied if it is the normal place of residence of the person or persons living in it, including if said person(s) are temporarily absent. A vacant housing unit is classified as such if no one is living in it on a permanent basis, excluding temporary absence. Vacancy rates are calculated during U.S. Census years as a potential indictor of distressed regions. According to the Oswego County Comprehensive Plan (2007), in 1990, Oswego County had a vacancy rate of 12.6%. This rate increased by 1.2% to a rate of 13.8% in 2000. Of the Cities and Villages located in Oswego County, 6 of the 10 of them experienced increases in vacancy rates during this timeframe. In 2000, the greatest vacancy rates were reported for the City of Fulton, Village of Pulaski, and Village of Lacona (Oswego County Comprehensive Plan, 2007).

Due to the high level of agricultural influence in Oswego County, active agricultural lands were mapped and are included in New York State agricultural district #11. This agricultural district was created in September 1982 and was certified in December 2007. Figure 2.9 shows the extent to which agricultural

district #11 is mapped throughout Oswego County. Table 3 shows the difference in land use percentages between the years 1988, 1999, and 2007. The largest increase of any land use category between 1988 and 2007 is vacant land at 8.2% and the largest decrease of any land use category is agriculture with -10.3%.

Table 3 – Comparison between 1988, 1999, and 2007 total land use percentages for Oswego County (Oswego County Comprehensive Plan)

Year	Agriculture	Residential	Vacant	Commercial	Recreational	Community Service	Industrial	Public Service	Forest, Wild, Conservation
1988	19.9%	33.9%	18.4%	1.5%	0.8%	1.1%	0.9%	3.5%	20.0%
1999	13.6%	36.7%	22.6%	1.9%	1.1%	1.1%	1.1%	2.7%	19.3%
2007	9.6%	40.5%	26.6%	1.8%	1.3%	1.1%	0.9%	2.0%	19.4%
Change	-10.3%	6.6%	8.2%	0.3%	0.5%	0.0%	0.0%	-1.5%	-0.5%

The majority of jurisdictions within Oswego County have adopted comprehensive/land use plans and/or zoning regulations in order to enforce specific regulations for certain types of land use or structures. The types of land use regulations implemented by each jurisdiction within the County are outlined in Table 4.

Table 4 – The land use regulations implemented by each jurisdiction within Oswego County are identified below. These regulations are from 2010, the last year available through the Oswego County Dept. of Community, Planning and Tourism.

Jurisdiction	Comprehensive Plan/Land Use Plan	Zoning	Subdivision Regulations	Mobile Home	Mobile Home Park	Junk Yard	Sign Law	Sanitary Code	Unif. Code	Flood Regulations	Others
Towns											
Albion	Adopted	-	Adopted	Local Law	-	Local Law	-	-	Atlantic Inland	Local Law	-
Amboy	In Process	-	-	-	-	Local Law	-	-	Atlantic Inland	-	-
Boylston	-	Local Law	-	Local Law	Local Law	-	-	-	Locally Enforced	-	-
Constantia	Adopted	Land Dev Law	Adopted	Local Law	Local Law	Local Law	-	Local Law	Atlantic Inland	Local Law	Site Plan Review, Outdoor Storage
Granby	Adopted	Local Law	Adopted	Local Law	Local Law	Local Law	In Zoning	In Zoning	Atlantic Inland	-	Site Plan Review
Hannibal	Adopted	Local Law	Adopted	-	-	Local Law	-	Local Law	Atlantic Inland	-	Site Plan Review
Hastings	Adopted	Local Law	Adopted	Local Law	Local Law	Local Law	In Zoning	Local Law	Locally Enforced	-	-
Mexico	Adopted	Local Law	Adopted	In Zoning	In Zoning	In Zoning	In Zoning	Local Law	Locally Enforced	Local Law	-
Minetto	-	Local Law	Adopted	In Zoning	In Zoning	In Zoning	In Zoning	-	Locally Enforced	Local Law	-
New Haven	In Process	Land Dev Law	-	-	-	-	-	-	Atlantic Inland	Local Law	Flood Damage Prevention
Orwell	Adopted	-	-	-	Local Law	-	-	-	Locally Enforced	Local Law	Hazardous Waste Inc.
Oswego	Adopted	Local Law	Adopted	Local Law	-	In Zoning	In Zoning	Local Law	Locally Enforced	Local Law	-
Palermo	Adopted	-	Adopted	Local Law	Local Law	Local Law	-	Local Law	Locally Enforced	-	Site Plan Review
Parish	Adopted	Local Law	Adopted	Local Law	Local Law	Local Law	-	-	Atlantic Inland	Local Law	-
Redfield	-	-	Adopted	-	-	Local Law	-	-	Atlantic Inland	-	-
Richland	In Process	Local Law	Adopted	In Zoning	In Zoning	Local Law	In Zoning	Local Law	Locally Enforced	Local Law	Outdoor Storage
Sandy Creek	In Process	-	-	Local Law	Local Law	Local Law	-	Local Law	Locally Enforced	Local Law	Site Plan Review
Schroeppel	Adopted	Local Law	Adopted	Local Law	Local Law	Local Law	Local Law	Local Law	Locally Enforced	Local Law	-

Table 4 – The land use regulations implemented by each jurisdiction within Oswego County are identified below. These regulations are from 2010, the last year available through the Oswego County Dept. of Community, Planning and Tourism.

Jurisdiction	Comprehensive Plan/Land Use Plan	Zoning	Subdivision Regulations	Mobile Home	Mobile Home Park	Junk Yard	Sign Law	Sanitary Code	Unif. Code	Flood Regulations	Others
Scriba	Adopted	In Process	Adopted	-	-	Local Law	-	-	Atlantic Inland	Local Law	Water & Sewer Ord., Site Plan Review
Volney	Adopted	Local Law	Adopted	Local Law	In Zoning	In Zoning	In Zoning	-	Locally Enforced	Local Law	-
West Monroe	Adopted	-	Adopted	Local Law	Local Law	Local Law	-	Local Law	Locally Enforced	Local Law	Site Plan Review
Williamstown	-	-	-	-	-	-	-	Local Law	Atlantic Inland	Local Law	-
Villages											
Altmar	-	-	-	Local Law	-	-	-	-	Locally Enforced	Local Law	-
Cleveland	-	-	Adopted	Local Law	Local Law	Local Law	-	-	Atlantic Inland	Local Law	Site Plan Review
Hannibal	-	Local Law	Adopted	In Zoning	In Zoning	In Zoning	In Zoning	In Zoning	Atlantic Inland	Local Law	-
Central Square	Adopted	Local Law	Adopted	Local Law	In Zoning	Local Law	In Zoning	Local Law	Locally Enforced	Local Law	-
Mexico	In Process	Local Law	-	Local Law	In Zoning	Local Law	In Zoning	Local Law	Atlantic Inland	Local Law	-
Parish	Adopted	Local Law	Adopted	-	Local Law	Local Law	-	Local Law	Atlantic Inland	Local Law	-
Pulaski	In Process	Local Law	Adopted	Local Law	In Zoning	In Zoning	In Zoning	Local Law	Locally Enforced	Local Law	-
Lacona	-	-	-		Local Law	-	-	Local Law	Locally Enforced	Local Law	-
Sandy Creek	In Process	-	-	Local Law	Local Law	-	-	Local Law	Locally Enforced	Local Law	Site Plan Review
Phoenix	Adopted	Local Law	Adopted	Local Law	Local Law	In Zoning	In Zoning	Local Law	Locally Enforced	Local Law	Historic Preservation Dist.
Cities											
Oswego	Adopted	Local Law	In Zoning	In Housing/ Zoning	In Housing/ Zoning	Local Law	In Zoning	-	Locally Enforced	Local Law	Housing Code
Fulton	Adopted	Local Law	In Zoning	In Zoning	In Zoning	Local Law	In Zoning	Local Law	Locally Enforced	Local Law	Wetlands, Noise, Aban. Vehicles, Excavations

Figure 2.8 - This figure shows the National Land Cover Dataset (NLCD) information pertaining to Oswego County.

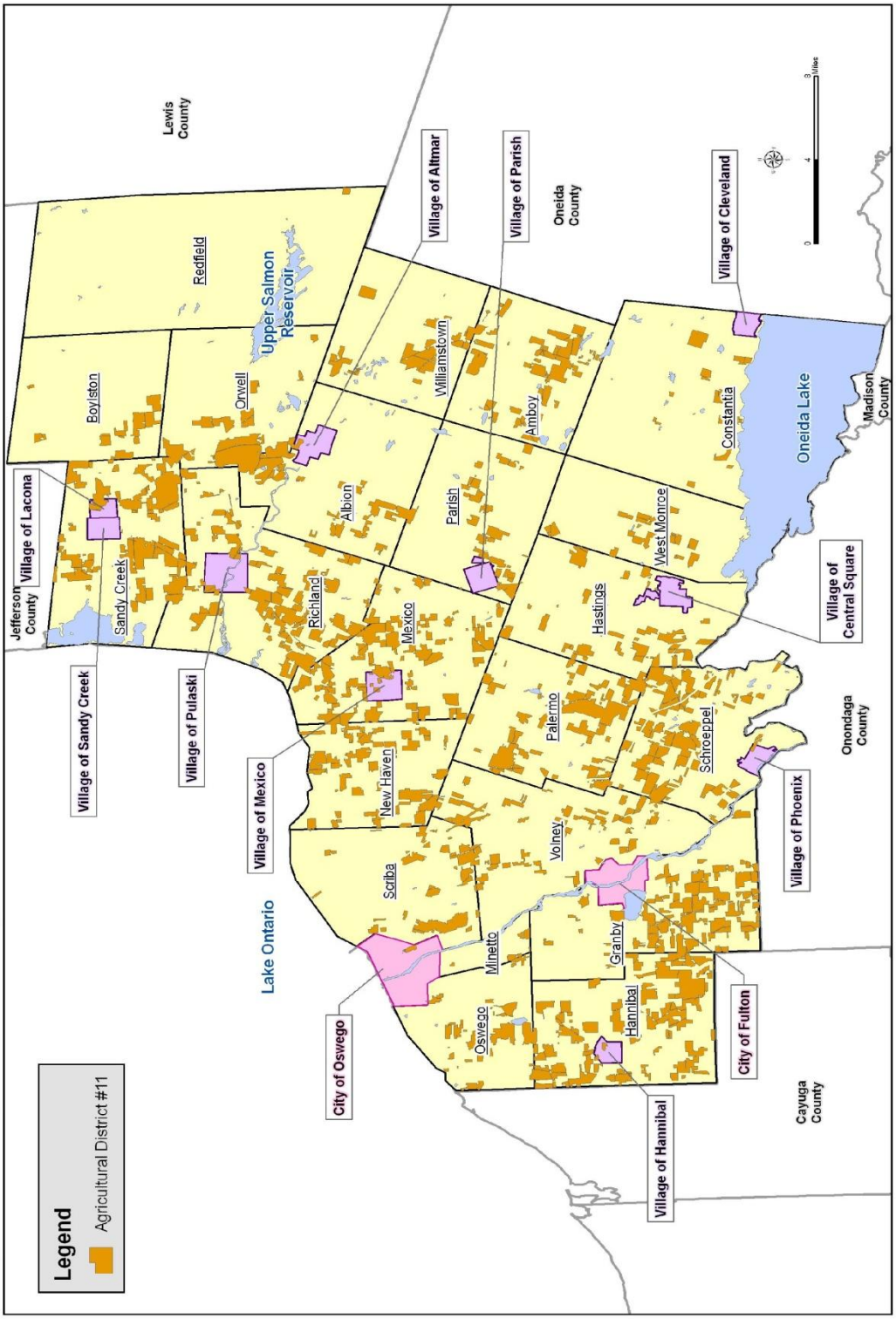


Figure 2.9 - This figure depicts the mapped locations of agricultural lands that are included in the recognized Agricultural District 11.

2.4 Economic Characteristics

Like the statewide economy, the unemployment rate in Oswego County has increased over the past year to approximately 9.5% (NYS Department of Labor, 2009). This is higher than the New York State unemployment rate of 8.8%. The increase or decrease in jobs for different industries is shown in Table 5. The data reported in this table represents the Syracuse Metropolitan Statistical Area (SMSA), which includes Madison, Onondaga, and Oswego Counties. Overall in the SMSA, 6,500 private sector jobs, or 2.4%, have been lost since the start of 2009.

Table 5 – Change Observed in Total Amount of Jobs in Different Industries in 2009 Within the Syracuse Metropolitan Statistical Area
(NYS Dept. of Labor)

Industry	Change Observed in 2009
Education & Health Services	+500
Manufacturing	-2,200
Trade, Transportation, Utilities	-1,900
Professional & Business Services	-1,000
Financial Activities	-600
Information	-400
Natural Resources, Mining, Construction	-400
Leisure & Hospitality	-300
Other Services	-200

The industry trends illustrated in Table 5 are also true for New York State. Education and health services were the only industry to see an increase in positions over the past year. Non-farm jobs fell by 2.0% over the past year in New York State. Working residents of Oswego County are primarily employed in government positions or in trade/transportation/utilities positions. Table 6 shows the percentages of employment by industry for Oswego County's employed population. The data illustrated in this table shows figures representing the first quarter of 2009.

Table 6 – Oswego County Employment by Industry, First Quarter 2009 (NYS Dept. of Labor)	
Industry	**Percent Employment**
Government	29%
Trade/Transportation/Utilities	22%
Education/Health	14%
Leisure/Hospitality	10%
Manufacturing	10%
Other	5%
Professional/Business	4%
Finance	3%
Mining/Construction/Natural Resources	3%

Overall, over 6,000 jobs have been lost in Oswego County since September 2008. Table 7 lists the top 10 employers within Oswego County for 2009 and how many people were employed by each company.

Table 7 – Top 10 Employers for Oswego County and Their Employment Totals for 2009 (Oswego County Dept. Community Development, Tourism, and Planning)	
Company Name	**# of Employees**
SUNY Oswego	4,030
Oswego County Government	1,033
Constellation Energy	899
Wal-Mart	840
Central Square School District	818
Oswego Health, Inc.	815
Novelis Corporation	742
Oswego City School District	701
Fulton School District	670
Oswego County Opportunities	657

The decrease in jobs over the past year has placed a significant hardship on many families and households within Oswego County. Those individuals that are employed take home below average weekly earnings, compared to the New York State overall average weekly earnings. Table 8 lists the different

employment industries within Oswego County and their average weekly earnings for the first quarter of 2009.

Table 8 – Oswego County Average Weekly Earnings by Industry, First Quarter 2009 (NYS Dept. of Labor)

Industry	Average Weekly Earnings
Trade/Transportation/Utilities	$1,000
Manufacturing	$982
Government	$701
Construction	$626
Education and Health	$612
Information	$547
Professional and Business	$511
Financial	$509
Natural Resources/Mining	$382
Other Services	$348
Leisure and Hospitality	$200
Overall Average	**$698**

Table 9 includes other economic characteristics for Oswego County and compares them to the same characteristics for New York State. This table includes 2000 data from the 2000 Census and estimated data for the years 2006-2008. Data listed in Table 8 only includes the County population that is 16 years or older.

Table 9 – Economic Characteristics of Oswego County, 2000 and 2006-2008 (U.S. Census Bureau)

	2000	%	NYS	2006-2008	%	NYS
Labor Force	59,778	64.0%	61.1%	61,784	63.1%	63.5%
Travel Time to Work (mins)	24.4	-	31.7	24.3	-	31.4
Median Household Income ($)	$36,598	-	$43,393	$43,643	-	$55,401
Median Family Income ($)	$43,821	-	$51,691	$54,795	-	$67,229
Per Capita Income ($)	$16,853	-	$23,389	$21,376	-	$30,804
Families Below Poverty Line	3,047	9.7%	11.5%	-	11.2%	10.5%
Individuals Below Poverty Line	16,470	14.0%	14.6%	-	16.0%	13.8%

2.5 Climate

According to Oswego County's Comprehensive Plan, the climate of the County is that of the continental type, predominantly influenced by the gently rolling topography, the prevailing westerly winds, and the proximity of the County to Lake Ontario. Normal temperatures for Oswego County are very similar to those of the northeastern United States and Western Europe; however, the temperature can be significantly influenced by Lake Ontario. The County's monthly precipitation is well distributed throughout the year. The total rainfall can vary from an annual average of 36 inches in the southwest section of the County to 55 inches in the northeast section of the County, located within the Tug Hill Region. Seasonal snow averages for Oswego County range from less than 90 inches in the southwest section to more than 200 inches in the Tug Hill area (northeastern section). Oswego County is included in the Eastern Lake Ontario snowbelt.

The Tug Hill Region is recognized as having a short growing season and as being one of the wettest and snowiest areas of New York State. Frost may be expected in Oswego County between early October and late May. The prevailing winds shift towards the north-west in winter and towards the south-west in the summer. The following Figures 2.10, 2.11, and 2.12 illustrate different aspects of Oswego County's climate. In these three figures, the yellow star denotes the approximate location of central Oswego County.

Figure 2.10 – Average January Temperatures for New York State
(World Book)

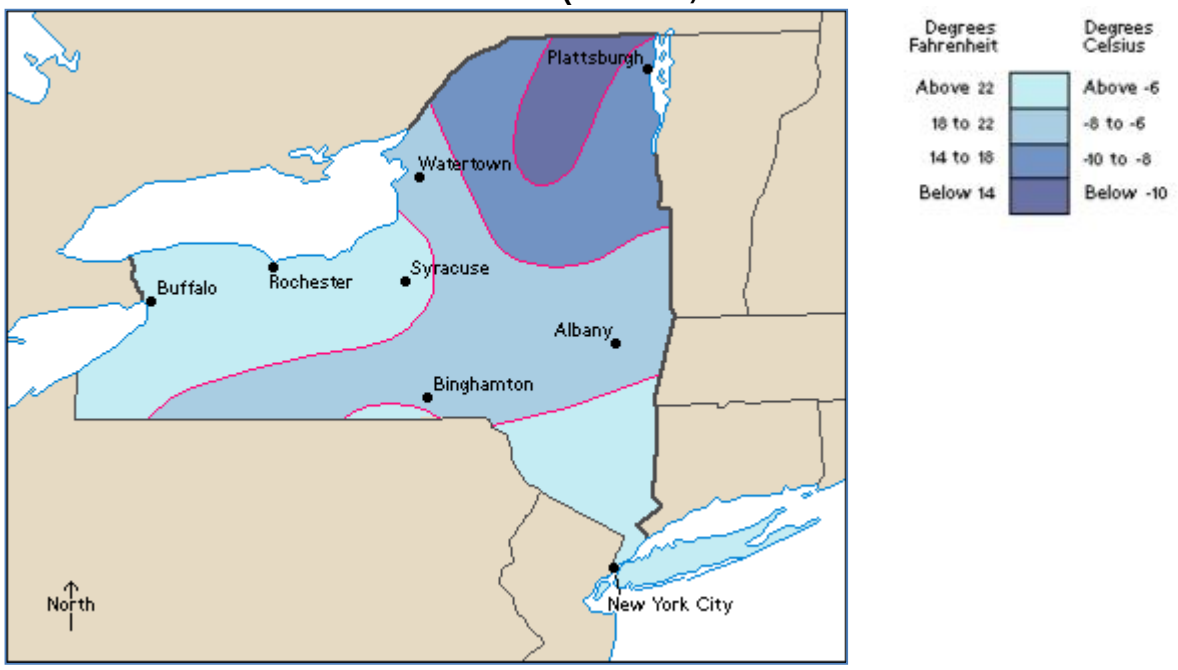


Figure 2.11 – Average July Temperatures for New York State
(World Book)

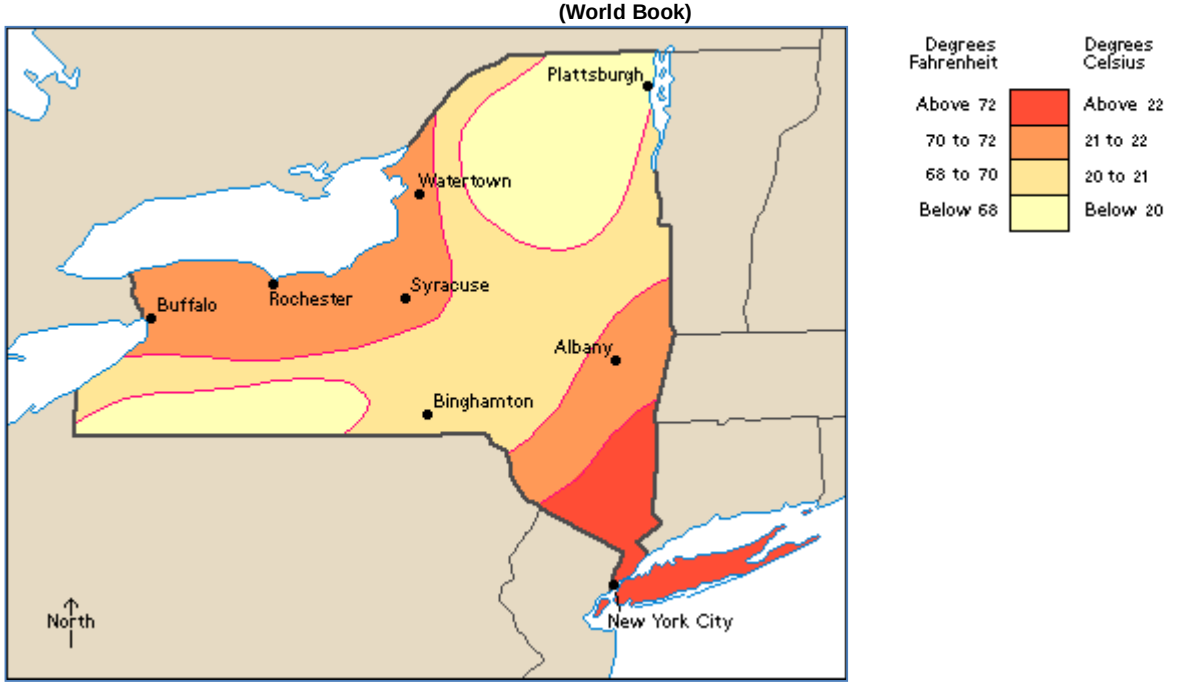
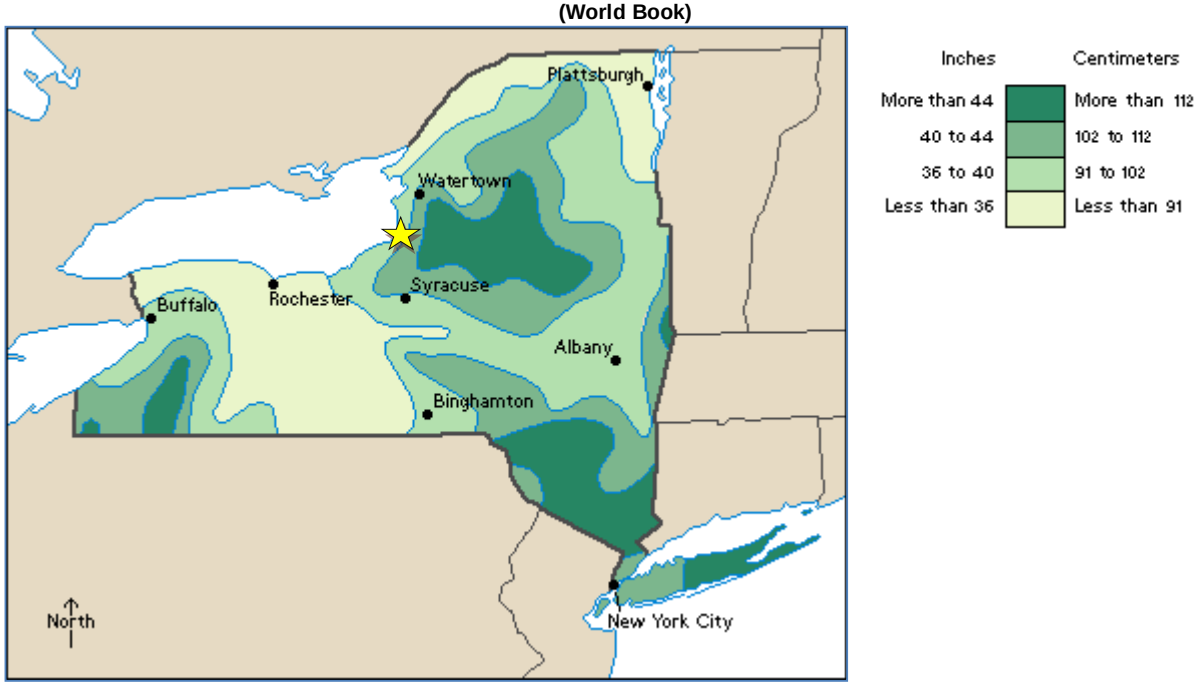


Figure 2.12 – Average Yearly Precipitation for New York State
(World Book)



2.6 Transportation

The purpose of a transportation network is to move people and/or goods safely and efficiently. In Oswego County, roadway and limited air transportation travel options are available. Interstate Route 81 travels north-south through the heart of Oswego County, entering the County in the Town of Hastings and leaving through the Town of Sandy Creek. Interstate Route 81 also passes through the following jurisdictions within Oswego County: Village of Central Square, Village of Parish, Town of Parish, Town of Mexico, Town of Richland, Village of Pulaski, and Village of Sandy Creek. This is the main access route to reach Oswego County from the north and south, and the main evacuation route to exit the County. U.S. Route 11, the first plank road in the United States, parallels Interstate Route 81 from the Town of Hastings to the Town of Sandy Creek, within Oswego County. This route is also a main access and exit point for Oswego County, though it is only a two-lane, 45 mile per hour (mph) roadway. No other U.S. Routes are located within Oswego County.

In addition to Interstate Route 81, U.S. Route 11, and numerous local roadways, Oswego County includes 14 NYS Routes (104, 104A, 104B, 3, 13, 176, 183, 264, 34, 48, 481, 49, 69, and 69A) and 9 County Routes (16, 43, 176, 57, 28, 34, 4, 26, 3). The locations of these routes, along with Interstate 81 and U.S. Route 11, are shown on Figure 2.13.

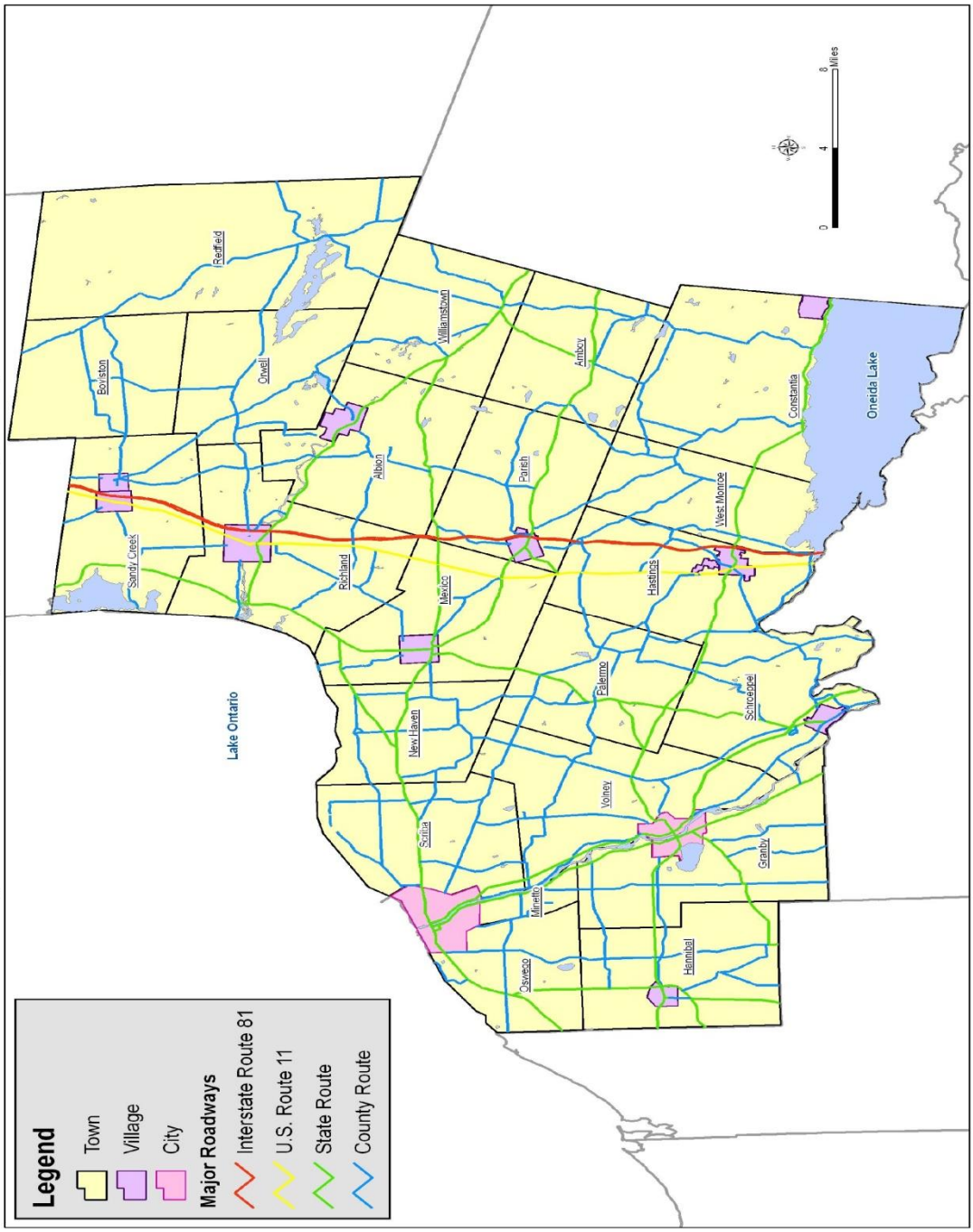


Figure 2.13 - Major Roadways Located Within Oswego County

The Oswego County Highway Department (HWD) maintains 505 miles of County roads, 113 bridges, 4000 culverts, 7000 signs, and 35 miles of guide railing. The HWD contracts with the NYSDOT to assist in snow removal along state owned roadways. The County HWD is responsible for snow removal on 295.51 lane miles of state highways and 7 parking lots owned by the state. The County HWD also removes snow on 54.34 miles of County roads and County facility parking lots. The County contracts with Town Highway Departments to remove snow on the remaining 450 miles of County roads. The Oswego County Highway Department has 3 maintenance facilities, 1 each in the Towns of Scriba, Parish, and Richland (Oswego County Highway Department).

Located within Oswego County are a total of 30.9 miles of federal roads, 290.6 miles of state roads, 503.4 miles of County roads, and 1155.3 miles of local roads, for a total of 1980.2 miles of roadway within the County limits. Along with the 113 bridges that Oswego County maintains, the NYSDOT is responsible for the maintenance of 104 bridges and the local municipalities maintain 22 bridge locations (Oswego County Comprehensive Plan, 2007).

The active portions of the rail system within Oswego County are used to transport freight only. The majority of these rail segments are owned and/or operated by CSX Transportation, Inc. The active CSX railroad tracks run between Onondaga County and the City of Oswego, through the City of Fulton, and between Onondaga County and Jefferson County, paralleling the Interstate Route 81 corridor. Many of the east-west railroad segments have been abandoned and the tracks removed. Figure 2.14 illustrates Oswego County's rail system and the status of all railroad tracks in the County.

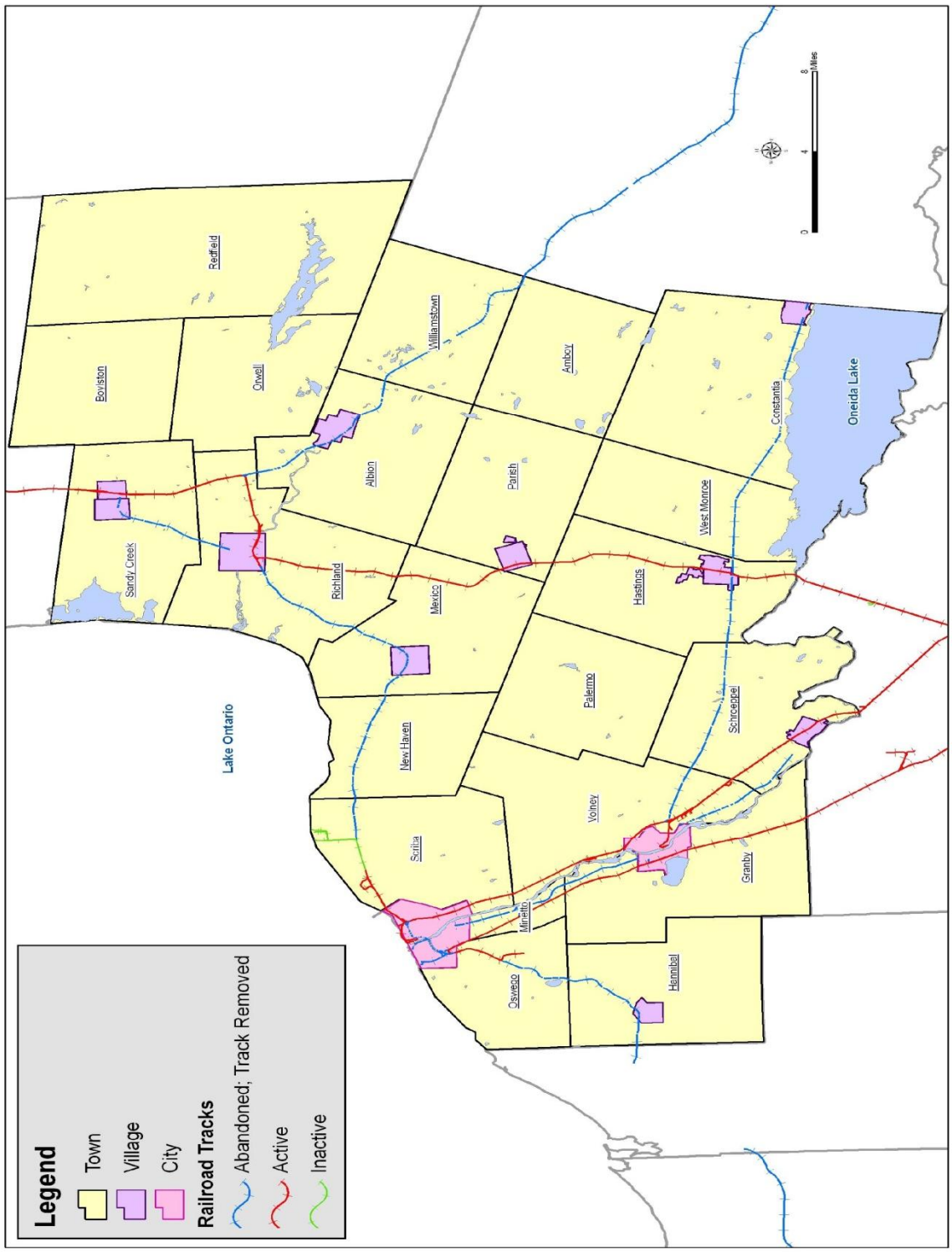


Figure 2.14 - Railroad Tracks Located Within Oswego County

The air transportation within Oswego County is limited. The closest international airports are the Syracuse Hancock International Airport in the City of Syracuse, Onondaga County and the Watertown International Airport in the City of Watertown, Jefferson County. There are eleven airports located within Oswego County; most are under private ownership. Table 10 details these eleven airport facilities. Figure 2.15 depicts the locations of airport facilities within the County.

Table 10 – Airport Facilities Located Within Oswego County
(Global Aviation Navigator, Inc.)

Name	Location	ICAO ID No.*	IATA ID No.*	Ownership	Runway(s)
Spring Brook Airport	Town of Palermo	0NK1	0NK1	private	1 – turf
Riveredge Airpark Airport	Town of Hastings	19NK	19NK	private	1 – turf
Engineers Airport	Town of Constantia	NK82	NK82	private	1 – turf
Kidder Field	Town of Sandy Creek	1NY2	1NY2	private	1 – turf
Oswego Co. at Pulaski Heliport	Village of Pulaski	05NY	05NY	private	None
Richland Airport	Town of Richland	1NY3	1NY3	private	1 – turf
Caughdenoy Airport	Town of Hastings	1NY9	1NY9	private	1 – turf
Oswego County Airport	Town of Volney	KFZY	FZY	public	2 – asphalt
Mexico Airdrome	Town of Mexico	NY96	NY96	private	1 – turf
Kingdom Field	Town of Scriba	5NK5	5NK5	private	1 – turf

*IATA = International Air Transport Association
*ICAO = International Civil Aviation Organization

The Oswego County Airport is owned by the administration of Oswego County and was designated by the Federal Aviation Administration (FAA) years ago as a general aviation reliever to Hancock International Airport. The Airport serves local pilots and national/international companies with fueling and hanger facilities. The airport grounds also host a charter service and have recently hosted a flight school and a restaurant. The Airport includes two runways, 100 ft by 4000 ft and 100 ft by 5200 ft, as well as all taxiways, hangers, and

approximately 400 acres of land area. Figures 2.16 and 2.17 represent an aerial image of the Oswego County Airport and a schematic of the airport facilities and grounds.

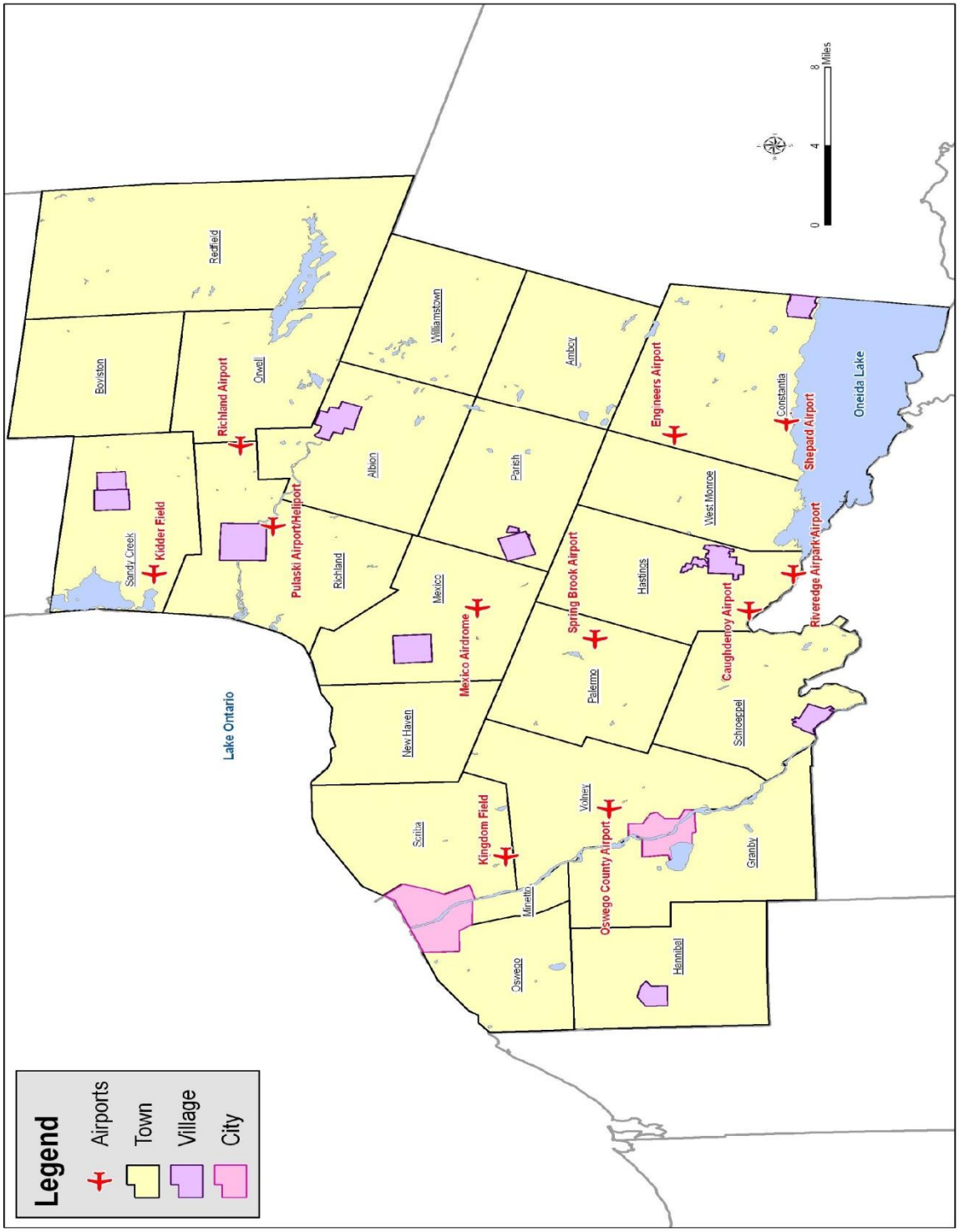


Figure 2.15 - Airports Located Within Oswego County

Figure 2.16 – Orthoimage of the Oswego County Airport located in the Town of Volney
(Oswego County Airport)

Figure 2.17 – General Schematic Showing the Oswego County Airport Facility and Grounds (Oswego County Airport)

Oswego County is home to one of the major shipping ports on Lake Ontario, the Port of Oswego. This port is located at the mouth of the Oswego River. The Port of Oswego has a depth of 27 feet and a width of 750 feet. Storage facilities at the Port consist of over 100,000 square feet of shed space, 400,000 square feet of open storage, and a 32,000 ton storage building, all adjacent to active CSX railroad tracks.

Various recreational trails and facilities exist within Oswego County. They can be found in both urban (City of Oswego riverfront esplanades and fitness trails) and rural settings. Many trails are multi-seasonal and multi-modal. Trail use continues to grow across all age categories as outdoor recreation activities become more aligned with personal physical goals. The Seaway Trail is the only state designated bicycle route in the County. This trail enters Oswego County from Jefferson County in the Town of Sandy Creek, along NYS Route 3 and exits the County along NYS Route 104 in the Town of Hannibal. The Seaway Trail maps indicate multiple points of interest along the trail within Oswego County, including the Selkirk Lighthouse, Grindstone Farms, Derby Hill Bird Observatory, Fort Ontario State Historic Site, Richardson Bates House Museum, and Ontario Orchards. There is also an extension to the Seaway Trail called the Salmon Hatchery Bicycle Loop. Multiple other bicycle trails operated and maintained by cycling groups and local businesses are also located throughout the County. Many jurisdictions within the County are also planning to add pedestrian walkways within their communities in the near future, including the Town of Hastings, the Village of Pulaski, and the City of Fulton.

Oswego County is strategically located, since the southern part of the County is within commuting distance to the City of Syracuse and the northern part of the County is within commuting distance to the City of Watertown. This strategic location is confirmed through an analysis of the commuting patterns of those that reside in Oswego County. Table 11 indicates the places of work for Oswego County's residents. According to the County's Comprehensive Plan, the

lowest percentage of those commuting out of the County for work live in the Town of Scriba, the Town of Oswego, and the Town of Minetto. The highest percentage of those commuting out of the County for work live in the Town of West Monroe, the Town of Schroeppel, the Village of Cleveland, and the Town of Hastings.

Table 11 – Places of Work, 2006-2008
(U.S. Census Bureau)

	Total	Males	Females
Works in State of Residence	99.3%	98.9%	99.8%
Works in County of Residence	56.5%	52.5%	61.0%
Works Outside County of Residence	42.8%	46.3%	38.8%
Works Outside State of Residence	0.7%	1.1%	0.2%

According to 2003 data from the New York State Department of Transportation (NYSDOT), in 2000, aside from remaining in Oswego County (31,157 individuals), the most workers from Oswego County were commuting to Onondaga County (18,231 individuals). Workers also commuted from Oswego County to the following nearby Counties in 2000: Oneida (556 individuals), Jefferson (438 individuals), Cayuga (348 individuals), Madison (311 individuals), and Cortland (103 individuals). When the 2000 data is compared to the NYSDOT's commuting destination data for 1980, an increase in Oswego County commuters to Onondaga, Cayuga, Madison, Oneida, and Cortland Counties is shown. This same data comparison indicates a decrease in commuters that remained within Oswego County and those that commuted to Jefferson County (Oswego County Comprehensive Plan, 2007).

2.7 Populations

According to the 2000 U.S. Census, the population of Oswego County was 122,377. This reflects an increase of 592 people when compared to the 1990 U.S. Census numbers for the County. The slow population growth exhibited by Oswego County is mirrored by many communities and Counties in

the North Country of New York State. Table 12 lists the estimated population numbers for the County and each jurisdiction from 2000 to 2008.

Table 12 – Oswego County Estimated Populations, 2000-2008

Estimated population numbers for Oswego County and the municipalities located within for the years 2000 to 2008. The year 2000 numbers are from that year's census, while the others are estimated based on average population growth within the given jurisdictions.

Jurisdiction	July 2008	July 2007	July 2006	July 2005	July 2004	July 2003	July 2002	July 2001	April 2000
Oswego County	121,395	121,459	121,595	122,013	122,829	122,727	122,283	122,174	122,377
City Oswego	17,351	17,387	17,462	17,519	17,673	17,758	17,786	17,904	17,954
City Fulton	11,219	11,253	11,309	11,387	11,527	11,602	11,642	11,707	11,855
Town Hastings	9,005	8,990	8,971	8,984	8,998	8,976	8,865	8,830	8,803
Town Schroeppel	8,423	8,451	8,480	8,511	8,576	8,557	8,539	8,536	8,566
Town Oswego	8,196	8,196	8,051	8,124	8,125	7,876	7,745	7,606	7,287
Town Scriba	7,198	7,201	7,223	7,234	7,297	7,320	7,252	7,190	7,331
Town Granby	6,823	6,830	6,864	6,891	6,959	6,991	6,974	6,968	7,009
Town Volney	6,014	6,029	6,049	6,062	6,105	6,132	6,120	6,123	6,094
Town Richland	5,661	5,664	5,681	5,715	5,763	5,771	5,772	5,777	5,824
Town Mexico	5,304	5,296	5,294	5,284	5,301	5,292	5,238	5,208	5,181
Town Constantia	5,073	5,085	5,101	5,112	5,144	5,159	5,140	5,124	5,141
Town Hannibal	4,825	4,840	4,861	4,888	4,946	4,935	4,930	4,933	4,957
Town West Monroe	4,491	4,469	4,450	4,444	4,453	4,436	4,419	4,426	4,428
Town Sandy Creek	3,784	3,787	3,789	3,795	3,822	3,833	3,834	3,839	3,863
Town Palermo	3,697	3,681	3,681	3,690	3,702	3,697	3,695	3,683	3,686
Town New Haven	2,894	2,870	2,886	2,903	2,926	2,934	2,931	2,923	2,930
Town Parish	2,649	2,660	2,677	2,685	2,708	2,697	2,692	2,686	2,694
Village Pulaski	2,282	2,289	2,303	2,317	2,343	2,355	2,361	2,372	2,398
Village Phoenix	2,138	2,146	2,159	2,172	2,196	2,209	2,215	2,226	2,251
Town Albion	2,032	2,039	2,050	2,062	2,074	2,070	2,069	2,068	2,083
Village Central Square	1,727	1,730	1,735	1,737	1,739	1,743	1,728	1,732	1,646
Town Minetto	1,651	1,655	1,662	1,671	1,671	1,662	1,653	1,652	1,663
Village Mexico	1,531	1,537	1,545	1,541	1,555	1,559	1,554	1,559	1,572
Town Amboy	1,317	1,322	1,316	1,323	1,325	1,311	1,295	1,301	1,312
Town Williamstown	1,314	1,309	1,307	1,316	1,332	1,336	1,337	1,339	1,350
Town Orwell	1,290	1,269	1,267	1,264	1,271	1,261	1,247	1,246	1,254
Village Sandy Creek	748	751	756	762	772	775	778	783	789
Village Cleveland	731	734	737	741	748	751	751	752	758
Town Redfield	667	663	652	640	630	617	603	603	607
Village Lacona	559	561	565	568	575	579	582	585	590
Town Boylston	517	513	512	509	501	504	505	502	505
Village Hannibal	513	515	519	520	527	531	533	536	542

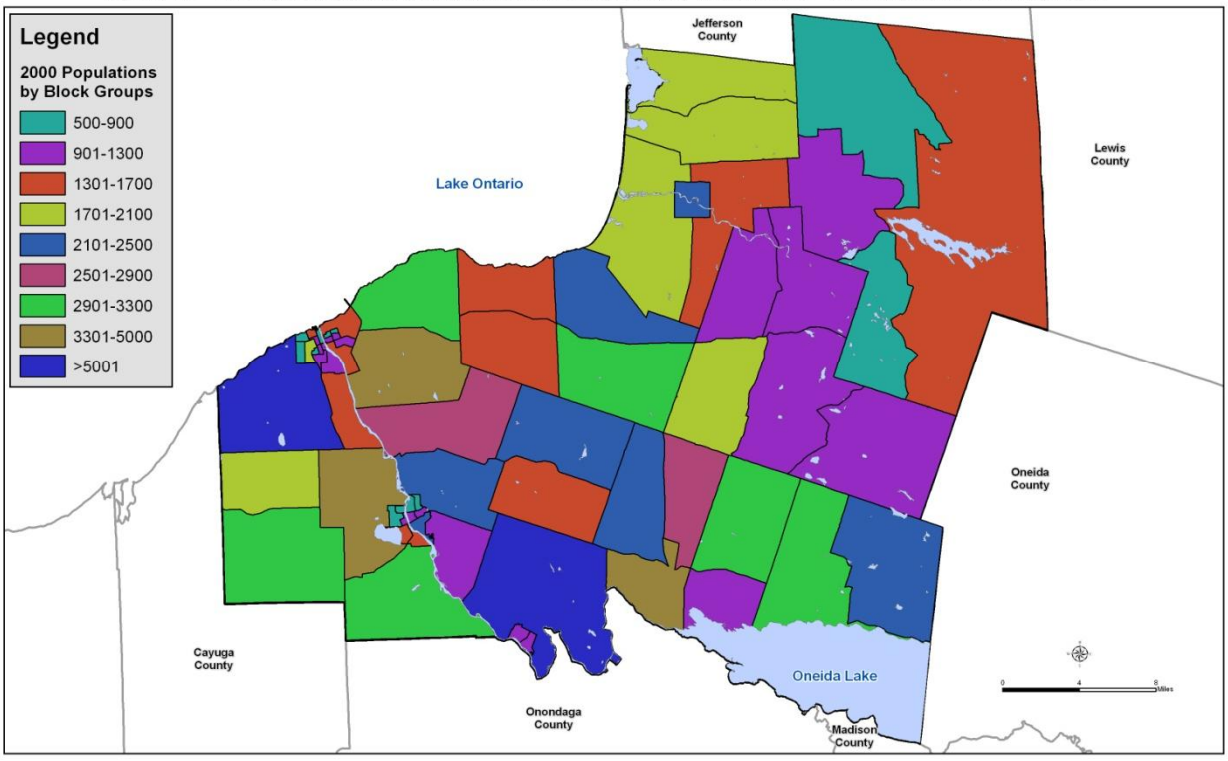
Table 12 – Oswego County Estimated Populations, 2000-2008

Estimated population numbers for Oswego County and the municipalities located within for the years 2000 to 2008. The year 2000 numbers are from that year's census, while the others are estimated based on average population growth within the given jurisdictions.

Jurisdiction	July 2008	July 2007	July 2006	July 2005	July 2004	July 2003	July 2002	July 2001	April 2000
Village Parish	484	486	489	490	497	500	502	505	512
Village Altmar	348	349	351	354	358	360	354	348	351

Between the years 1990 and 2000, the jurisdictions that exhibited the largest decrease in population were the City of Oswego (-1241) and the City of Fulton (-1074). The jurisdictions that gained the most people within the same time period were the Towns of Scriba (859), Hastings (690), and Volney (410). Figure 2.18 depicts population ranges within Oswego County by block groups. Block groups are census clusters that make up larger areas classified as census tracts. A census block group is a cluster of census blocks having the same first digit of their 4-digit identifying numbers within a census tract.

Figure 2.18 - This figure depicts populations within Oswego County from the 2000 census by census block groups.



Though overall population numbers have been steadily declining, population densities within Oswego County have been slowly climbing since the 1950's (see Figure 2.19). The jurisdictions with the lowest population densities (based on the 2000 U.S. Census data) are the Town of Redfield (8.2 persons per square mile) and the Town of Boylston (12.8 persons per square mile). The jurisdictions within Oswego County that have the highest population densities (based on the 2000 U.S. Census data) are the City of Oswego and the City of Fulton, though both locations have seen a decrease in population density between 1990 and 2000. Table 13 lists jurisdictions within Oswego County that had negative changes in population density between 1990 and 2000.

Figure 2.19 - Overall Population Density in Oswego County, 1950 - 2000

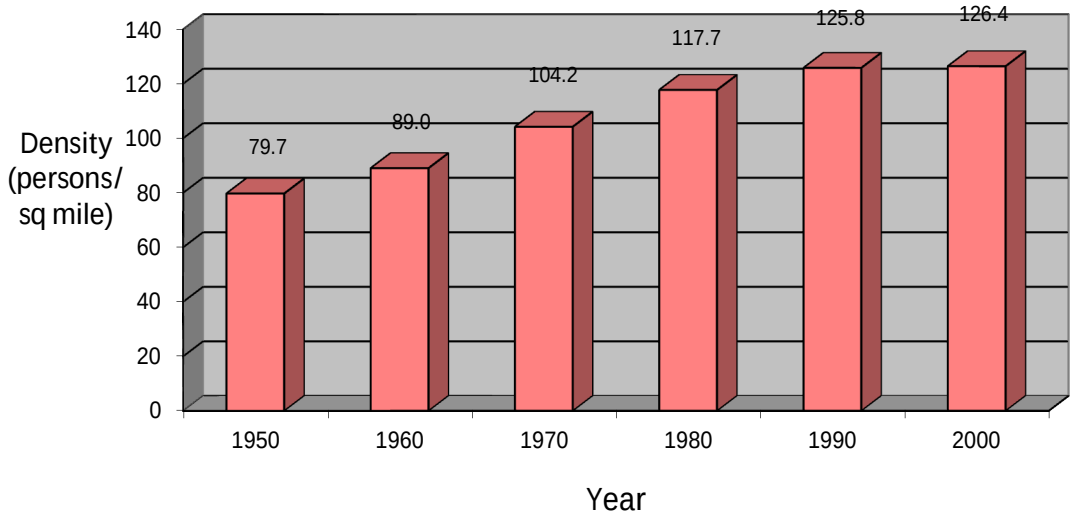


Table 13 – Jurisdictions within Oswego County that Exhibited Negative Population Densities, 1990 to 2000
(Oswego County Comprehensive Plan, 2009)

Jurisdiction	Percent Change in Pop. Density
Village of Hannibal	-11.6 %
Town of Oswego	-9.2 %
Town of Minetto	-8.7 %
City of Fulton	-8.3 %
Village of Phoenix	-7.6 %
City of Oswego	-6.4 %
Village of Pulaski	-5.0 %
Town of Schroeppel	-4.1 %
Village of Cleveland	-3.3 %
Village of Central Square	-1.5 %
Village of Sandy Creek	-0.5 %

The remaining jurisdictions within Oswego County reported positive changes in population density between 1990 and 2000, including the Villages of Altmar, Mexico, and Parish.

The U.S. Census Bureau estimated that between the years 2006-2008, the total population of Oswego County was 121,483, further analyzed as 60,279 males (49.6%) and 61,204 females (50.4%). The median age for the County's population within this time period was 36.8; 6,553 people were estimated to be under the age of 5 years, 94,019 were estimated to be 18 years of age or older, 14,495 (11.9%) people of which were over the age of 65.

The U.S. Census Bureau estimated that between the years 2006-2008, 96.5% of the population within Oswego County was White. Additional races and their percent compositions of the overall County population include: Black or African American – 1,168 people or 1.0%; American Indian and Alaska Native – 433 people or 0.4%; Asian – 727 people or 0.6%; Native Hawaiian and Other

Pacific Islander – 23 people or <0.1%; some other race – 457 people or 0.4%; and two or more races – 1,493 people or 1.2%.

2.8 Critical Community Facilities

The critical facilities within Oswego County were identified by representatives of each jurisdiction, as well as by County representatives. These results were combined into a single geographic information system (GIS) County-wide coverage. The critical facilities located within Oswego County are illustrated in Figure 2.20. For greater clarity, Figures 2.21, 2.22, and 2.23, show the County's critical facilities separated into working group areas – Northern, Central, and Southern. Many of the critical facilities identified within the County are clustered around the Cities and Villages, where the population densities are highest. There are also numerous critical facilities mapped along the Oswego River corridor and the Interstate Route 81/NYS Route 11 corridor. Table 14 details the distribution of critical facilities identified within Oswego County. In this table the numbers and types of critical facilities are listed for each jurisdiction.

Table 14 – Number of Certain Critical Facilities by Jurisdiction

Jurisdiction	Airports Heliports	Ambulance	Fire Stations	Government Building	Medical Facility	Police Stations	Special Needs	Hospitals	Schools	Dams	U.S. Postal Service	Municipal Highway Garage	Municipal Park	Military Facility
City Fulton	-	1	2	1	3	1	-	-	5	2	1	1	4	-
City Oswego	-	1	2	3	1	2	3	1	10	4	1	1	6	2
Village Altmar	-	-	1	1	-	-	-	-	1	1	1	-	-	-
Village Central Sq.	-	1	1	1	1	1	-	-	5	-	1	-	1	-
Village Cleveland	-	1	1	1	-	-	-	-	1	1	1	-	1	-
Village Hannibal	-	-	1	1	1	-	-	-	1	1	1	-	-	-
Village Lacona	-	-	1	1	1	-	-	-	1	-	1	1	-	-
Village Mexico	-	1	1	1	1	-	-	-	3	3	1	1	1	-
Village Parish	-	-	1	1	1	-	-	-	1	1	1	2	-	-
Village Phoenix	-	-	2	1	1	1	-	-	3	1	1	-	1	-
Village Pulaski	1	1	1	1	1	1	2	-	2	1	1	1	2	-
Village Sandy Creek	-	-	1	1	1	-	-	-	2	-	1	1	1	-

Table 14 – Number of Certain Critical Facilities by Jurisdiction

Jurisdiction	Airports Heliports	Ambulance	Fire Stations	Government Building	Medical Facility	Police Stations	Special Needs	Hospitals	Schools	Dams	U.S. Postal Service	Municipal Highway Garage	Municipal Park	Military Facility
Town Albion	-	-	-	1	-	-	-	-	-	11	-	1	-	-
Town Amboy	-	-	1	1	-	-	-	-	-	6	-	1	1	-
Town Boylston	-	-	-	1	-	-	-	-	-	-	-	1	-	-
Town Constantia	1	-	1	1	-	-	-	-	1	13	2	1	10	-
Town Granby	-	-	3	1	-	-	-	-	1	2	-	1	-	-
Town Hannibal	-	-	-	1	-	-	-	-	2	2	-	1	1	-
Town Hastings	2	1	2	1	-	1	-	-	1	6	2	1	-	-
Town Mexico	1	-	-	1	-	-	-	-	1	2	1	1	2	-
Town Minetto	-	-	1	1	-	-	-	-	1	2	1	1	-	-
Town New Haven	-	-	1	1	-	-	-	-	1	3	1	1	-	-
Town Orwell	-	-	1	1	1	-	-	-	-	9	1	1	-	-
Town Oswego	-	-	1	1	1	-	-	-	1	5	-	1	-	-
Town Palermo	1	-	1	1	-	-	-	-	1	4	-	1	-	-
Town Parish	-	-	-	1	-	-	-	-	2	4	-	1	1	-
Town Redfield	-	-	1	1	-	-	-	-	-	2	1	1	-	-
Town Richland	1	-	1	1	-	-	2	-	-	2		2	1	-
Town Sandy Creek	1	-	-	1	-	-	-	-	1	4	-	1	2	-
Town Schroeppel	-	-	2	1	-	-	-	-	-	4	1	1	1	-
Town Scriba	1	-	1	1	-	-	-	-	-	2	1	2	2	-
Town Volney	1	-	2	1	1	-	1	-	1	7	-	1	-	-
Town West Monroe	-	-	1	1	-	-	-	-	-	-	1	1	1	-
Town Williamstown	-	-	1	1	-	-	-	-	1	2	1	1	1	-

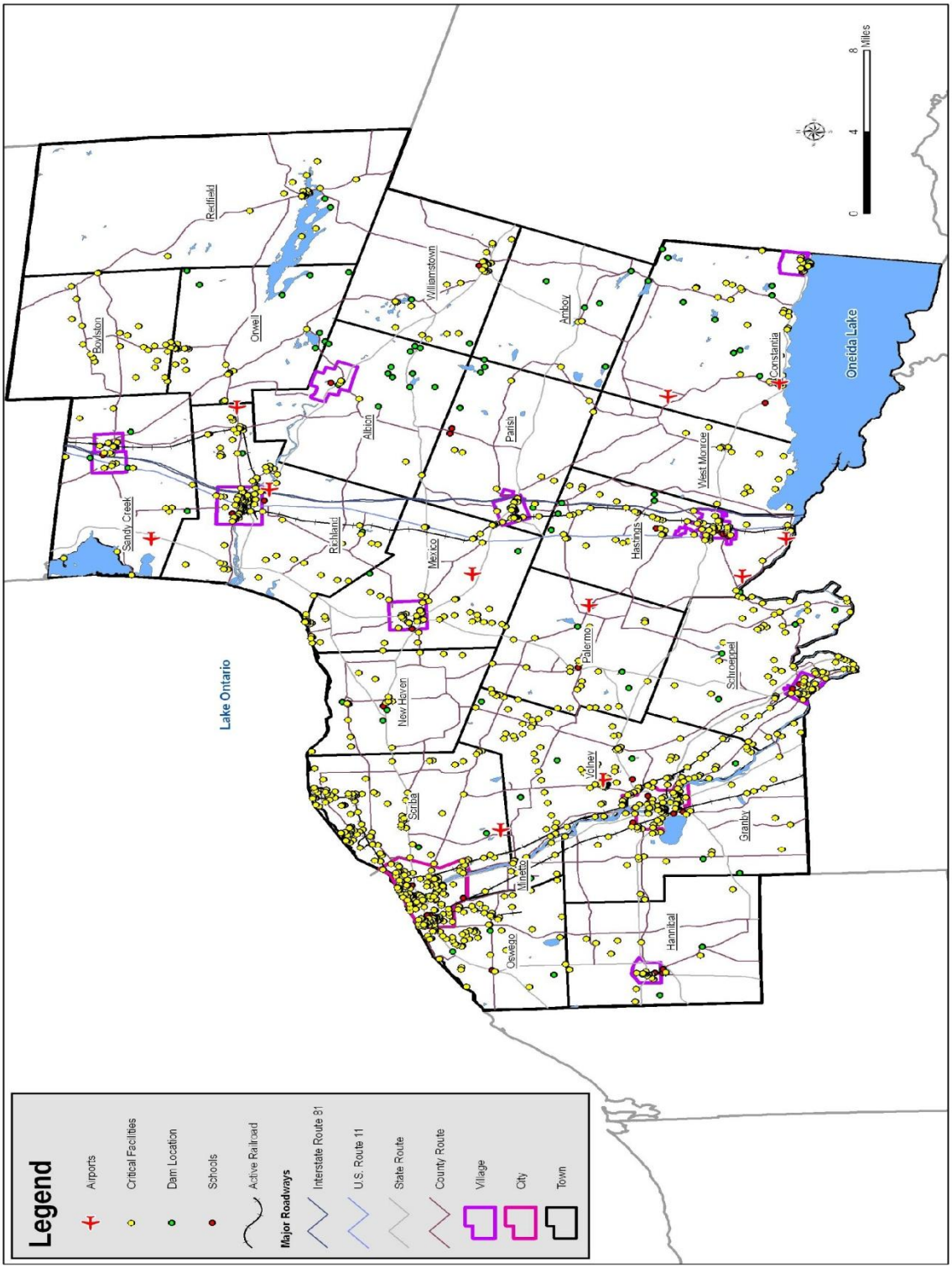


Figure 2.20 - Mapped Critical Facilities Within Oswego County

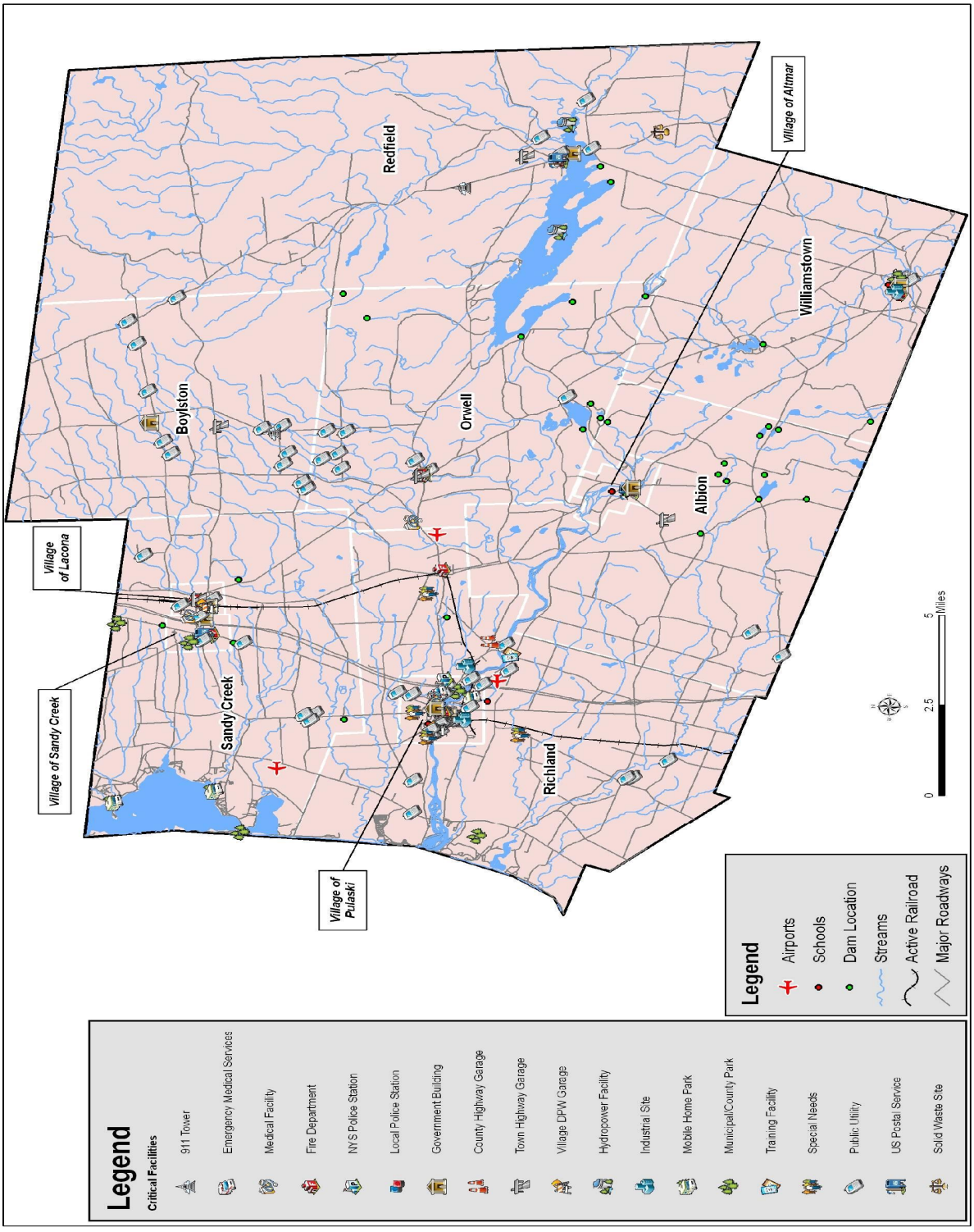


Figure 2.21 - Northern Working Group: Critical Facilities

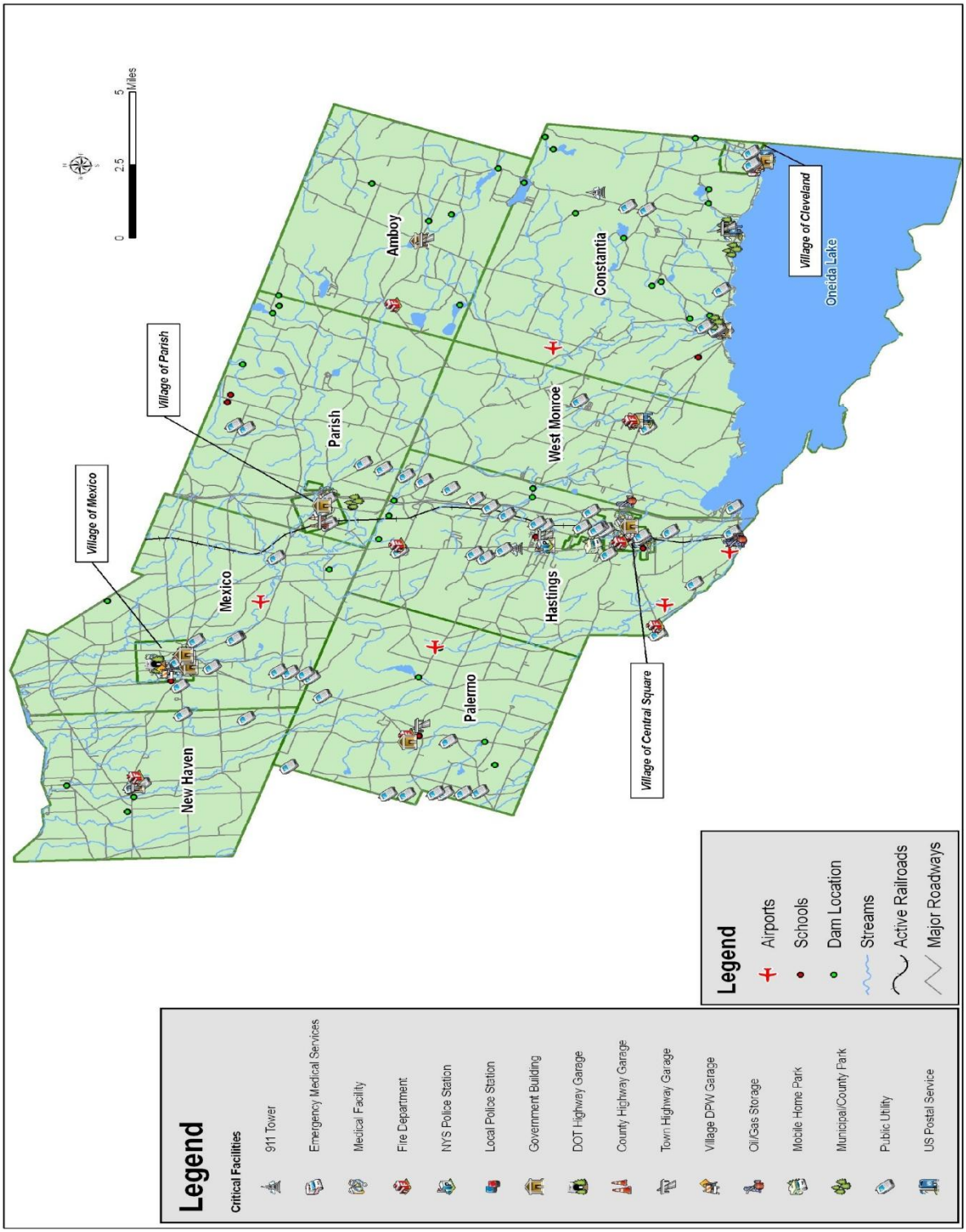
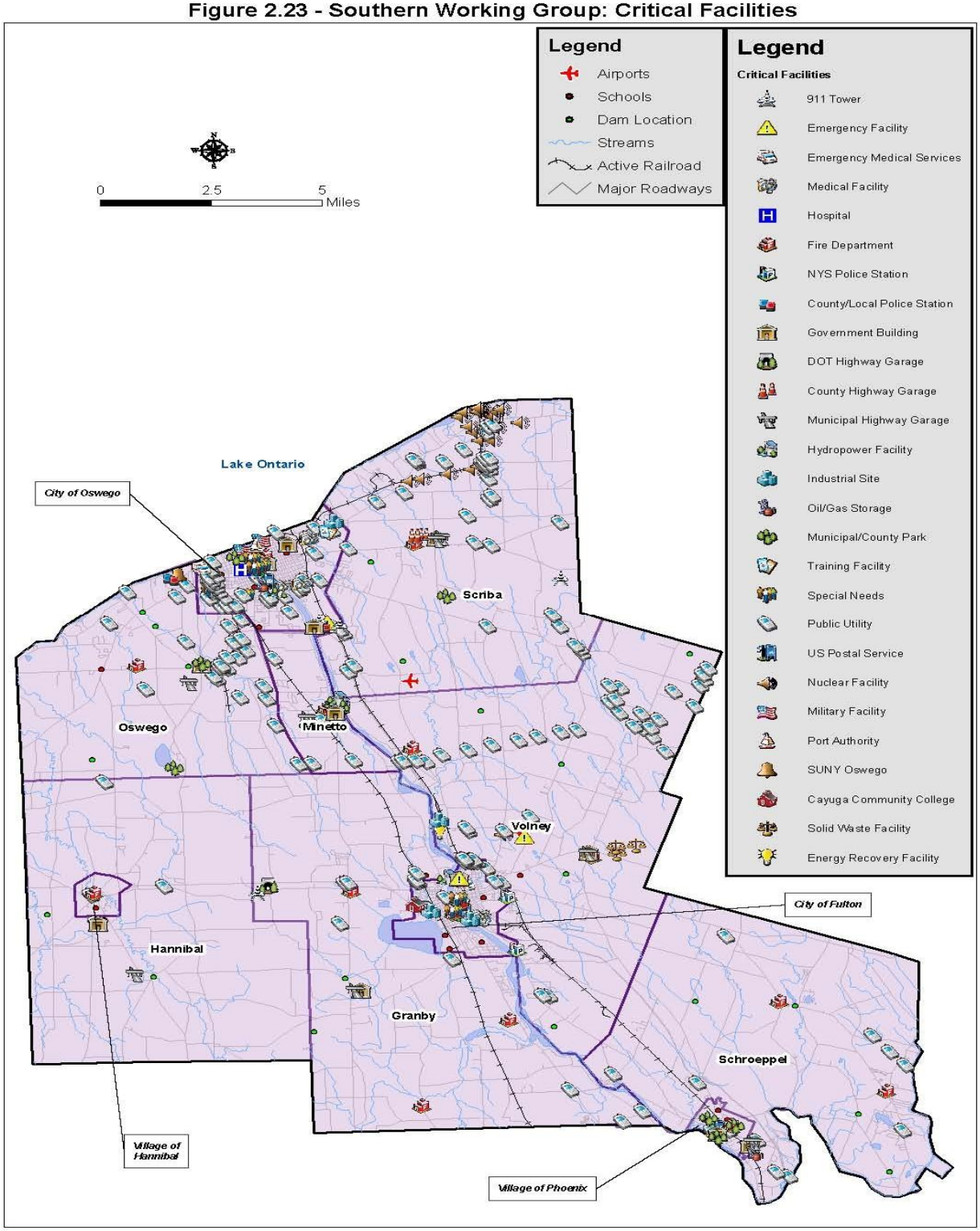


Figure 2.22 - Central Working Group: Critical Facilities

Figure 2.23 - Southern Working Group: Critical Facilities



2.8.1 Hospitals, Medical Facilities, and Special Needs Facilities

There is one hospital located within Oswego County; the Oswego Hospital in the City of Oswego. A second hospital, A.L. Lee Memorial Hospital, was located in the City of Fulton, but closed in early 2009 and is now an Urgent Care Center operated by Oswego Health (Oswego Hospital). The Oswego Hospital has 164 beds and is staffed by more than 130 physicians representing more than 25 specialties. The Oswego Hospital has multiple satellite facilities located throughout the County, including the City of Fulton. There are also numerous medical facilities and housing facilities for the elderly and mentally ill, depicted as special needs facilities on Figure 2.24, located within the County.

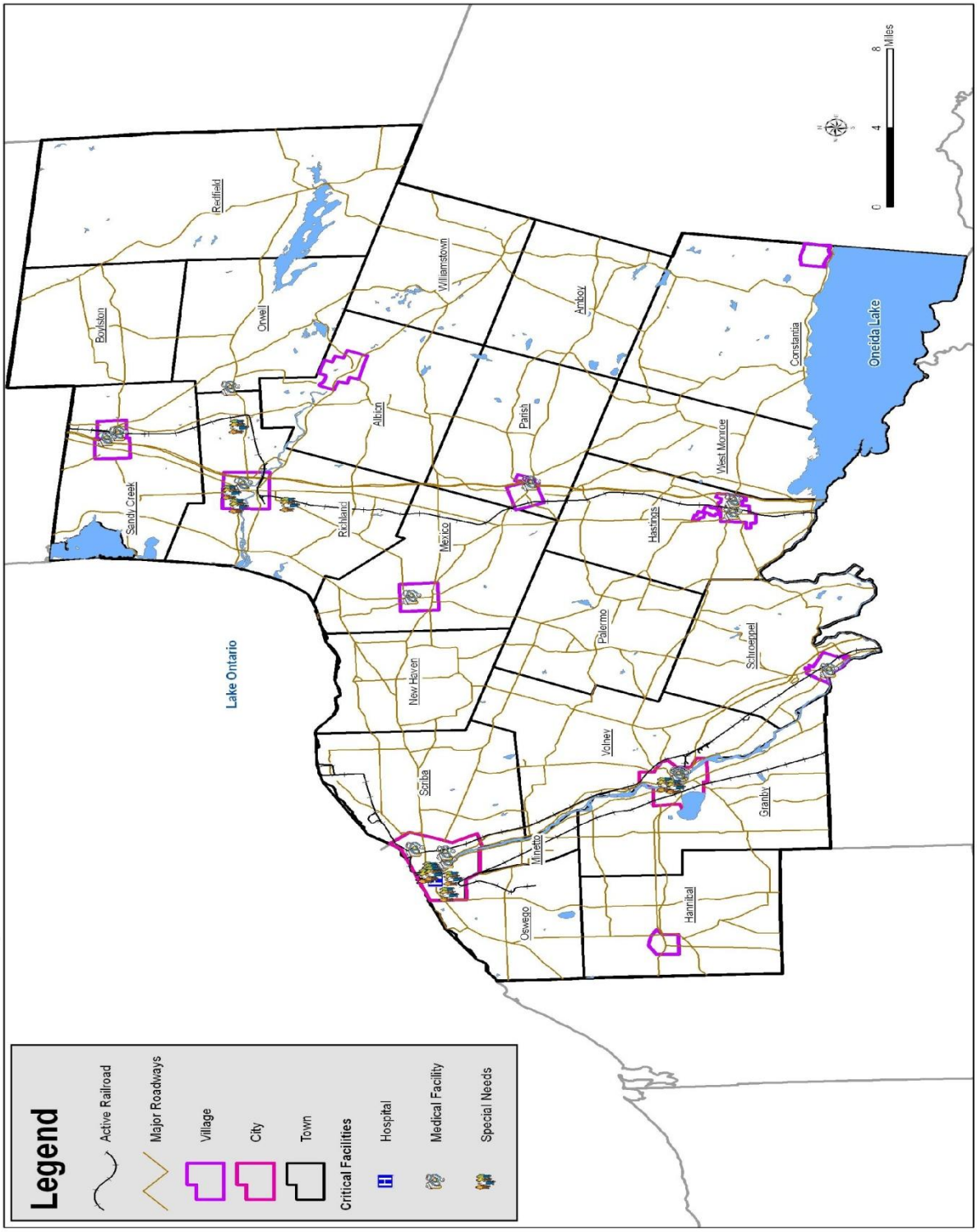


Figure 2.24 - Hospitals, Medical Facilities, and Special Needs Facilities Located Within Oswego County

2.8.2 Police Stations, Ambulance Facilities, and Fire Stations

Oswego County has 36 fire departments, 7 ambulance centers, and a total of 6 police stations. Oswego County is located within Troop D of the NY State Police. There are three (3) NY State police substations located among the following jurisdictions: Town of Hastings, Village of Pulaski, and Town of Volney. The Oswego County Sheriff's Office is located in the City of Oswego along NYS Route 481. This facility provides law enforcement County-wide and also operates a direct supervision correctional facility. Oswego County has 7 ambulance facilities consisting of the following: Southern Oswego Volunteer Ambulance Corps (SOVAC) (Village of Central Square), Oswego County Ambulance Service (Menter's) (City of Fulton), Donald McFee Ambulance Service (Village of Mexico), Northern Oswego County Ambulance (NOCA) (Village of Pulaski), North Shore Ambulance (Village of Cleveland), City of Oswego Fire Department (City of Oswego), and Student Volunteer Ambulance Corps (SAVAC) (SUNY Oswego Campus in the City of Oswego).

The following list identifies all fire departments located within Oswego County, along with the number of stations for each department (if more than one), and the jurisdiction in which each department is located:

- Defiance Volunteer Fire Department – located in Village of Altmar, also serves the Town of Albion
- Fulton Fire Department – two stations – located in City of Fulton
- Caughdenoy Volunteer Fire Department – two stations – located in Town of Hastings and Town of Schroeppel
- Cleveland Volunteer Fire Company – located in Village of Cleveland, also serves part of Oneida County
- Central Square Volunteer Fire Company – located in Village of Central Square

- Cody Volunteer Fire Department – two stations – located in Town of Granby
- Constantia Volunteer Fire Department – located in Town of Constantia
- Granby Center Volunteer Fire Department – located in Town of Granby
- Hastings Fire Department – located in Town of Hastings
- Hannibal Fire Company – located in Village of Hannibal
- Lacona Volunteer Fire Company – located in Village of Lacona
- Mexico Volunteer Fire Company – located in Village of Mexico
- Minetto Volunteer Fire Corporation – located in Town of Minetto
- New Haven Volunteer Fire Department – located in Town of New Haven
- Orwell Fire Company – located in Town of Orwell
- Oswego City Fire Department – two stations – located in City of Oswego
- Palermo Volunteer Fire Department – located in Town of Palermo
- Parish Volunteer Fire Company – located in Village of Parish
- Pennellville Volunteer Fire Department – located in Town of Schroeppel
- Ringgold Fire & Rescue – located in Village of Pulaski
- Redfield Fire Department – located in Town of Redfield
- Richland Volunteer Fire Department – located in Town of Richland
- Sandy Creek Volunteer Fire Department – located in Village of Sandy Creek
- Scriba Volunteer Fire Department – located in Town of Scriba

- Volney Volunteer Fire Corporation – two stations – located in Town of Volney
- West Amboy Volunteer Fire Company – located in Town of Amboy
- Williamstown Fire Department – located in Town of Williamstown
- West Monroe Volunteer Fire Department – located in Town of West Monroe
- Oswego Town Volunteer Fire Department – located in Town of Oswego
- Enterprise Fire Company, No. 1 – three stations – two are located in Village of Phoenix, 1 located in Onondaga County

Only two of the fire departments located within Oswego County are non-volunteer, the City of Oswego and the City of Fulton departments. In addition to the 36 fire stations listed above, there are three industries within the County that have their own private fire departments: Novelis Fire Brigade, James A. Fitzpatrick Nuclear Power Plant Fire Department, Nine Mile Point Unit 1 Fire Department, and the Nine Mile Point Unit 2 Fire Department. Also, a portion of the Town of Hastings is served by the Brewerton Volunteer Fire Department, whose station is located in Onondaga County.

All police stations, ambulance facilities, and fire stations located within Oswego County are depicted on Figure 2.25.

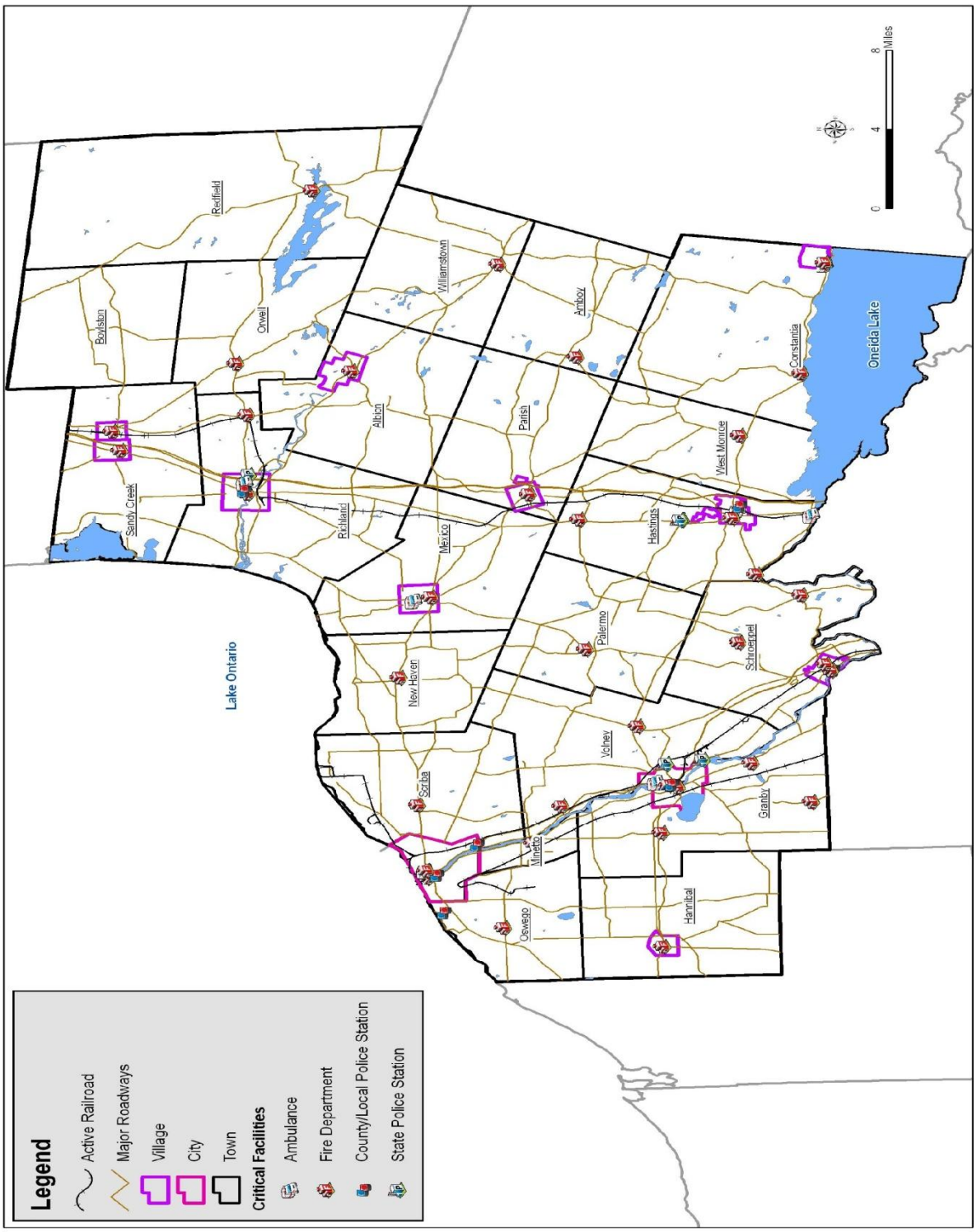


Figure 2.25 - Police and Fire Stations Located Within Oswego County

2.8.3 Schools

There are nine school districts located within Oswego County. These districts comprise a total of 42 public schools and 6 private schools. Cumulatively, these schools provide for approximately 24,100 students. Oswego County Board of Cooperative Educational Services (BOCES) provides special education for a total of 1,000 students both in the Town of Mexico and throughout the County at host districts. The Town of Mexico campus provides career and technical information for about 800 students (who are included in their school populations) and about 70 adult education program students. Additionally, the State University of New York (SUNY) at Oswego campus is located in the Town of Oswego and the City of Fulton houses a branch of the Cayuga Community College (CCC).

SUNY Oswego was established at its current location in 1913. This college is 1 of 13 university colleges in the SUNY system. The campus consists of 45 buildings with classroom, laboratory, residential, and athletic facilities. Approximately 8,000 students enroll at SUNY Oswego a year. Figure 2.20 shows the locations of all schools and colleges County-wide.

The Fulton Campus of Cayuga Community College (CCC) was started in January 1994. Cayuga Community College has an annual enrollment around 3,900; this total represents those students at the Fulton and Auburn campuses. During the fall 2008 semester, 1,029 students were enrolled at the Fulton branch of CCC.

2.8.4 Nuclear Facilities

The Nine Mile Point Nuclear Power Facility is a two-unit nuclear reactor power plant located along Lake Ontario in the Town of Scriba. The James A. Fitzpatrick Nuclear Generating Station, also located on the Nine Mile Facility property, has one General Electric boiling water reactor. The first Nine Mile Point reactor began operations in 1969, followed by the James A. Fitzpatrick plant in 1975 and the second Nine Mile Point reactor in 1987. The James A. Fitzpatrick plant is operated by Entergy Nuclear, who bought it from the New York Power Authority in 2000. Constellation Energy group obtained ownership of Nine Mile Point reactor 1 in 2001 from the Niagara Mohawk Power Corporation (now National Grid). Constellation Energy Group also purchased the majority of Nine Mile Point reactor 2, the remainder of which is owned by the Long Island Power Authority (The Post-Standard, 2009).

Because the Nine Mile Point Nuclear Power Facility is located in the Town of Scriba, Oswego County has implemented a Radiological Emergency Preparedness Program to help assure the safety of County residents that reside near the power facility. In the event of an emergency at Nine Mile, sirens and tone-alert weather radios are in place to audibly alert residents to tune into an Emergency Alert System station via radio or television. These emergency measures are in place to support a 10-mile Emergency Planning Zone that is centered around the location of the Nine Mile Point facility. As a backup method to the Emergency Alert System, a reverse notification system called HyperReach has also been put in place to protect areas and citizens within the Emergency Planning Zone and Oswego County.

2.8.5 Utilities

Power: National Grid is the supplier of electricity within Oswego County. National Grid has 8 transmission substations, 30 electric distribution substations, and 165-miles of overhead transmission lines located within Oswego County. Within Oswego County, power is also generated at the following facilities: Nine Mile Point Nuclear Station Units 1 and 2 located in the Town of Scriba, FitzPatrick Nuclear Plant located in Town of Scriba, NRG Energy, Inc. located in the City of Oswego, Independence Station located in the Town of Scriba, and multiple hydropower facilities on the Oswego and Salmon Rivers.

Oil/Gas: The Dominion Transmission natural gas pipeline stretches from the Town of Schroeppel to the Oswego County boundary. A short spur of the Buckeye petroleum pipeline extends from the Brewerton terminal located on East River Road, across the Oneida River, and ends at just west of NYR Route 11 at the Oswego/Onondaga County boundary. Four oil/gas storage and shipping facilities that supply oil and gas to the residents of Oswego County are Oneida Lake Petroleum in the Village of Central Square, Buckeye Terminals in the Town of Brewerton (Onondaga County), Suburban Propane in the Village of Phoenix, and Glider Oil in the City of Oswego. Additional smaller propane facilities are also located within Oswego County, including Amerigas in the Town of Minetto and the E&V Energy Company in the City of Fulton.

Solid Waste: The Bristol Hill Landfill, located in the Town of Volney, is the only active landfill that serves the solid waste needs of Oswego County. This is a 90-acre NYS Department of Environmental Conservation (NYSDEC) permitted double-composite lined landfill that disposes of approximately 50,264 tons (2007) of solid waste a year (B&L, 2009). The Oswego County Department of Solid Waste also runs an Energy Recovery Facility (ERF) in the City of Fulton. This facility,

originally commissioned in 1985, converts approximately 200 tons of solid waste per day into usable energy. If the ERF produces more energy than what is required to run the system, the excess electricity is sold to National Grid. Between July 1999 and June 2000, the ERF processed over 60,000 tons of waste resulting in the generation of over 400,000,000 pounds of steam.

Water/Wastewater: Extensive wastewater treatment facilities and systems are installed in the Cities of Fulton and Oswego. Smaller wastewater treatment systems are located in additional smaller communities within Oswego County. The intake tunnel for a portion of the Onondaga County Water Authority (OCWA) water supply system is located in the City of Oswego. This system draws water from Lake Ontario. The Metropolitan Water Board is in charge of treating the water from Lake Ontario; OCWA purchases this treated water wholesale.

More populous areas of the County have established water districts which provide residents and businesses with drinking water and provide fire protection from water hydrants installed as part of the water system infrastructure. OCWA customers located in Oswego County receive drinking water that originates from Lake Ontario. Currently, drinking water supply systems are in place in at least a small portion of the following jurisdictions in Oswego County: City of Oswego, City of Fulton, Village of Cleveland, Town/Village of Hannibal, Town/Village of Mexico, Town of New Haven, Town of Orwell, Village of Phoenix, Village of Pulaski, Town of Richland, Village of Sandy Creek, Village of Lacona, Town of Scriba, and Town of Oswego.

2.8.6 *Historical and Cultural Resources*

Though the historical resources located within Oswego County are not pictured on the critical facility mapping, they represent the County's rich history and diverse character. The cultural, historical, and archaeological resources identified within Oswego County were determined through a query of the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) website. A total of 86 sites included on the National Register of Historic Places are included within the County. Appendix D includes a print-out of the identified historical and cultural resources within the County, including site names.

2.9 Oswego County Emergency Management Office

The Oswego County Emergency Management Office (EMO) serves as the disaster services and emergency preparedness center for the County. The EMO office is located in the City of Fulton along NYS Route 481 in the Oswego County Branch Building. The Oswego County Emergency Management Office maintains and administers an integrated emergency management program designed to ensure life safety, property and environmental protection from all natural, human-caused, and technological hazards through preparedness, prevention/mitigation, response and recovery.

The office provides planning and training resources, response and warning coordination, and information distribution through communications to the public, local government officials, and public safety agencies to assist them in emergency management.

EMO coordinates plans for emergency response, including county-wide and local comprehensive emergency management and hazard-specific plans such as radiological, hazardous materials, or multiple-casualty. The Director of Emergency Management is the point-of-contact for National Incident

Management System (NIMS) compliance for local governments and emergency response agencies. The office facilitated the County's designation as a National Weather Service StormReady Community, which ensures comprehensive weather monitoring and information dissemination programs.

The Emergency Management Office manages the Emergency Medical Services course sponsorship program through the New York State Department of Health/Emergency Medical Services Bureau.

In addition, during disaster response, the Emergency Management Office facilitates the County Emergency Operations Center, which coordinates and allocates resources, planning, public warning and information, and recovery with agencies involved in emergency response.

2.9.1 Oswego County Emergency Communicators

The Oswego County Emergency Communicators/RACES (Radio Amateur Civil Emergency Service) is a manpower and equipment communications resource that provides professional skills to the Office of Emergency Management and the government of Oswego County. These skills include administrative and logistical communications to the emergency service agencies within the County and to other jurisdictions including the State Emergency Management Office, when needed. Each RACES communicator is licensed by the Federal Communications Commission (FCC). The organization is administered under the guidance of the Oswego County Emergency Management Director.

The Oswego County Emergency Communicators support and area trained severe weather spotters in the National Weather Service's Skywarn™ program. Select communicators participate as sitting members of the Local Emergency Planning Committee and the Local Human Needs

Committee as part of their participation in Emergency Preparedness for Oswego County.

3.0 Planning Process and Documentation

3.1 Participation

To begin the Oswego County Multi-Jurisdiction Hazard Mitigation Plan process, participation letters were mailed to all jurisdictions within the County on April 8, 2009, detailing the mitigation planning process and goals and listing the dates, times, and locations of three kick-off meetings to further detail the process and participation requirements. This letter also included a Local Municipality Participation form in which each jurisdiction was asked whether they agreed or declined to participate. These initial letters were mailed out to the Mayors, Supervisors, Council Members, and Trustees of all jurisdictions within Oswego County. Additional mailings and contact was made with jurisdictions who originally chose to not participate or who did not respond to the initial participation request. Table 15 lists the participation criteria that were established at the beginning of the hazard mitigation planning process and included in Table 1. The jurisdictions located within Oswego County and their participation statuses are also included in this table.

Table 15 – Jurisdiction Participation and Criteria

Jurisdiction	Group Meetings Criterion	Group Exercises Criterion	Mitigation Activities Criterion	Review Draft Plan Criterion	Assist Public Review Criterion	Resolution Criterion
(T) Albion	MET	MET	MET	MET	MET	MET
(V) Altmar	MET	MET	MET	MET	MET	MET
(T) Amboy	MET	MET	MET	MET	MET	MET
(T) Boylston	MET	MET	MET	MET	MET	MET
(V) Central Square	MET	MET	MET	MET	MET	MET
(V) Cleveland	MET	MET	MET	MET	MET	MET
(T) Constantia	MET	MET	MET	MET	MET	MET
(C) Fulton	MET	MET	MET	MET	MET	MET
(T) Granby	MET	MET	MET	MET	MET	MET
(T) Hannibal	MET	MET	MET	MET	MET	MET

Table 15 – Jurisdiction Participation and Criteria						
Jurisdiction	**Group Meetings Criterion**	**Group Exercises Criterion**	**Mitigation Activities Criterion**	**Review Draft Plan Criterion**	**Assist Public Review Criterion**	**Resolution Criterion**
(V) Hannibal	MET	MET	MET	MET	MET	MET
(T) Hastings	MET	MET	MET	MET	MET	MET
(V) Lacona	MET	MET	MET	MET	MET	MET
(T) Mexico	MET	MET	MET	MET	MET	MET
(V) Mexico	MET	MET	MET	MET	MET	MET
(T) Minetto	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
(T) New Haven	MET	MET	MET	MET	MET	MET
(T) Orwell	MET	MET	MET	MET	MET	MET
(C) Oswego	MET	MET	MET	MET	MET	MET
(T) Oswego	MET	MET	MET	MET	MET	MET
(T) Palermo	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
(T) Parish	MET	MET	MET	MET	MET	MET
(V) Parish	MET	MET	MET	MET	MET	MET
(V) Phoenix	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
(V) Pulaski	MET	MET	MET	MET	MET	MET
(T) Redfield	MET	MET	MET	MET	MET	MET
(T) Richland	MET	MET	MET	MET	MET	MET
(T) Sandy Creek	MET	MET	MET	MET	MET	MET
(V) Sandy Creek	MET	MET	MET	MET	MET	MET
(T) Schroeppel	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
(T) Scriba	MET	MET	MET	MET	MET	MET
(T) Volney	MET	MET	MET	MET	MET	MET
(T) West Monroe	MET	MET	MET	MET	MET	MET
(T) Williamstown	MET	MET	MET	MET	MET	MET
Oswego County	MET	MET	MET	MET	MET	MET

Ultimately, as evidenced by Table 15, only four jurisdictions chose not to participate in this planning process: Town of Minetto, Town of Schroeppel, Town of Palermo, and Village of Phoenix. At least one representative was designated to represent each participating jurisdiction throughout the mitigation planning process. Those individuals who represented the participating jurisdictions throughout the mitigation planning process are listed in Table 16.

Table 16 – Jurisdiction of Representatives

List of individuals who have represented their jurisdiction/agency/group during the mitigation planning process. This table does not include Executive Committee members or those who attended the public meetings.

Name(s)	Title(s)/Role(s)	Jurisdiction/Agency/Group
Southern Working Group		
Anthony Gorea	Fire Chief	City of Fulton
Dan O'Brien	DPW Commissioner	City of Fulton
Dave Edwards	Supervisor Designee	Town of Granby
Ron Greenleaf	Mayor	Town of Hannibal
Virginia Wilbur	Councilwoman	Town of Hannibal
Rita Hooper	Councilwoman	Town of Hannibal
Joe Caruana	Trustee	Village of Hannibal
Terry Wilbur	Trustee	Village of Hannibal
Jason Kingsbury	Trustee	Village of Hannibal
Carl Emmons, Sr.	Councilman	Village of Hannibal
Sandra Blanchard	Councilwoman	Village of Hannibal
Duane Shepard	Councilman	Village of Hannibal
Joseph Perry	Fire Chief	City of Oswego
Michael Myers	Councilman	City of Oswego
Greg Herrmann	Councilman, 1st Lieutenant Town Oswego Volunteer FD	Town of Oswego
Dan Shaver	Councilman, 1st Assistant Chief FD	Town of Oswego
Brad Coe	Highway Superintendent	Town of Scriba
Terry Smith	Councilman	Town of Scriba
Edward Wavle	Councilman	Town of Volney
Robert Lighthall	Undersheriff	Oswego County
Jeff Grimshaw	Asst. Director Office of Business and Community Relations	SUNY Oswego
John DeHollander	Director	Oswego County SWCD
Steve Smith	Geographic Information Specialist	Oswego County Office Real Property
Mary Vanouse	Director of Community Development	City of Oswego
Karen Noyes	Associate Planner	Oswego County Dept. Community Development, Tourism, & Planning
Donna Scanlon	Director of Community Development Programs	Oswego County Dept. Community Development, Tourism, & Planning
Marty Weiss	Associate Planner	Oswego County Dept. Community Development, Tourism, & Planning
Central Working Group		
Dave Holst	Councilman	Town of Amboy
John Metzger	Councilman	Town of Constantia
Richard Colesante	Councilman	Town of Constantia
Deborah Kite	Trustee	Village of Cleveland
Joe Domachowske	Trustee	Village of Cleveland

Table 16 – Jurisdiction of Representatives

List of individuals who have represented their jurisdiction/agency/group during the mitigation planning process. This table does not include Executive Committee members or those who attended the public meetings.

Name(s)	Title(s)/Role(s)	Jurisdiction/Agency/Group
Malchoff Davis	Mayor	Village of Cleveland
Linda House	Deputy Supervisor	Town of Hastings
Jim Weatherup	Supervisor	Town of Hastings
Dennis Hotaling	Chief, CS Volunteer FD	Village of Central Square
Gary House	1st Assistant Chief, CS Volunteer FD	Village of Central Square
Mike Avery	Dept. Public Works	Village of Central Square
Ken Sherman	Trustee	Village of Central Square
Kenneth Hotaling	Councilman, Member CS Volunteer FD	Town of Hastings/Village of Central Square
Neal Turo	Chief, Hastings Volunteer FD	Town of Hastings
Paul Brissette	Central Square Schools	Town of Hastings
Millard Murphy	Mayor	Village of Central Square
C. Hadwin Fravor	Councilman	Town of Mexico
Bill Lighthall	Councilman	Town of Mexico
James Hotchkiss	Trustee	Village of Mexico
Terry Grimshaw	Mayor	Village of Mexico
Debra Allen	Town Clerk	Town of New Haven
Steve Stelmashuck	Supervisor	Town of Parish
Fred Swartz	Councilman	Town of Parish
Pat Lewis	Trustee	Village of Parish
Neil Chatterton	Trustee	Village of Parish
Leon Heagle	Mayor	Village of Parish
Gary Ross	Supervisor	Town of West Monroe
Paul Baxter	Executive Director	North Shore Council of Govrmnts, Town of West Monroe
Northern Working Group		
Ernie Wheeler	Mayor	Village of Pulaski
Donna Archer	Deputy Mayor	Village of Pulaski
Ron Crandall	Supervisor	Town of Richland
Kern Yerdon	Councilman	Town of Richland
Sue Haynes	Councilwoman	Town of Richland
Marilyn Roser	Supervisor	Town of Orwell
Frederick Potter	Councilman	Town of Boylston, Oswego County Fairgrounds
Francis Adams	Supervisor	Town of Redfield
Tanya Yerdon	Deputy Supervisor	Town of Redfield
Nancy Ridgeway	Town Council	Town of Sandy Creek
Paulette Lindsey	Town of Sandy Creek Resident	Town of Sandy Creek

Table 16 – Jurisdiction of Representatives

List of individuals who have represented their jurisdiction/agency/group during the mitigation planning process. This table does not include Executive Committee members or those who attended the public meetings.

Name(s)	Title(s)/Role(s)	Jurisdiction/Agency/Group
Don Norton	Chief	Sandy Creek Fire FD
Grant Rohrmoser	Mayor	Village of Sandy Creek
Allen Bradberry	Trustee	Village of Sandy Creek
Peggy Manchester	Mayor	Village of Lacona
Kim Crast	Assistant Chief	Lacona Volunteer FD, Village of Lacona
Nancy Sheeley	Councilwoman	Town of Albion
Carl Anson, Jr.	Councilman	Town of Albion
Corey Holcomb	Mayor	Village of Altmar
John "Chip" Hamblin	Supervisor	Town of Williamstown
Margaret Kastler	Oswego County Legislator	County Legislature, 1st District
V. Ladd-DeGraff	Emergency Planning Director	National Grid

3.2 Meeting Summary

As previously indicated, in an effort to make meetings more productive and well-attended, Oswego County was divided into three separate working groups that were based on geographic location. These working groups met separately working within their groups to complete the required tasks and forms and to discuss the potential for hazards and potential mitigation activities. The bulleted list below chronologically lists the mailings and meetings that were held in support of the County's Hazard Mitigation Plan. In some instances, one-on-one assistance was provided to jurisdictions to aid them in the completion of their hazard vulnerability assessments.

The progression of working group meetings was planned to follow the hazard mitigation planning steps outlined in the Disaster Mitigation Act of 2000 (DMA 2000). The four phases, or steps, included in DMA 2000 are as follows:

- **Phase 1: Planning Process**
  - *Organize: requirement 201.6(c)(1)*
  - *Involve the public: requirement 201.6(c)(1)*

- *Coordinate: requirement 201.6(b) (2)&(3)*

- **Phase 2: Risk Assessment**
  - *Assess the hazard: requirement 201.6(c)(2)(i)*
  - *Assess the problem: requirement 201.6(c)(2) (ii)&(iii)*
- **Phase 3: Mitigation Strategy**
  - *Set goals: requirement 201.6(c)(3)(i)*
  - *Review possible activities: requirement 201.6(c)(3) (ii)*
  - *Draft an action plan: requirement 201.6(c)(3) (iii)*
- **Phase 4: Plan Maintenance**
  - *Implement, evaluate, revise: requirement 201.6(c)(4)*

The meeting summaries that follow indicate which specific requirements, of those listed above, were satisfied during each gathering. Some meetings focused on multiple requirements, while others were used to provide additional one-on-one assistance to a single jurisdiction regarding a specific plan requirement. The meetings and coordination completed as part of the Oswego County hazard mitigation planning process are detailed below:

- **Executive Committee Meeting #1**
  - Dates, locations, and times for the first three kick-off meetings, one in each geographic area, were planned.
  - Executive committee members present: Oswego County Emergency Management Office (Pat Egan, Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County Department of Community Development, Tourism, and Planning (Kelly Jordal), Barton & Loguidice (John Condino, Johanna Duffy), and NYSOEM (Ron Raymond)
  - Requirement met: 201.6(b) (2)&(3)

- **Participation Letter**
  - Sent April 8, 2009
  - Sent to Municipal Supervisors, Mayors, Trustees, Council Members
  - Also sent to representatives of the following:
    - Oswego County Soil and Water Conservation District
    - Office of Business and Community Relations, SUNY Oswego
    - Oswego County Fire Advisory Board
    - Port Authority of Oswego
    - Cayuga Community College, Fulton Campus
    - Cornell Cooperative Extension of Oswego County
    - National Grid
    - Nine Mile Point Nuclear Station
    - James A. Fitzpatrick Nuclear Plant
    - Oswego County Highway Department
    - Oswego County Sheriff's Department
    - Emergency Response Training Center
    - Oswego County BOCES
    - Oswego County Real Property Office
    - U.S. Coast Guard Station
  - Purpose of this letter was to offer a brief description of the Multi-Jurisdictional Mitigation Planning process and benefits of completing such a plan. Announcements of the dates, times, and locations of the kick-off meetings for this project were provided. A form was enclosed for each jurisdiction to indicate whether they would participate in the mitigation planning process with the County.
  - Requirement met: 201.6(b) (2)&(3)

- **Kick-off Meeting #1 (Southern Working Group)**
  - Held on April 23, 2009 at 6:30 p.m.
  - Meeting located at the Sheldon Hall Ballroom on SUNY Oswego campus
  - Representatives of interested jurisdictions, agencies, groups, and the public were invited to attend
  - During this meeting, Ron Raymond, NYSOEM Region IV, gave a presentation on mitigation, the Disaster Mitigation Act of 2000, FEMA's role, and the reasons municipalities should participate in the process. John Condino, Barton & Loguidice, also presented a brief slideshow detailing how the mitigation plan will be developed and what the role of municipalities and partner agencies will be throughout the planning process.
  - Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office (Pat Egan, Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County Sheriff's Office (Robert Lighthall), NYSOEM (Ron Raymond), Town of Hannibal (Ron Greenleaf, Rita Hooper), Town of Oswego (Greg Herrmann), Town of Oswego Fire Department (Dan Shaver), Town of Scriba (Brad Coe), City of Oswego (Mary Vanouse, Michael Myers), Village of Hannibal (Joe Caruana, Terry Wilbur, Jason Kingsbury, Carl Emmons, Sr., Sandra Blanchard, Duane Shepard), Village of Sandy Creek (Alan Bradberry), SUNY Oswego (Jeff Grimshaw), Barton & Loguidice (Johanna Duffy, John Condino)
  - Requirement met: 201.6(c)(1)

- **Kick-off Meeting #2 (Central Working Group)**
  - Held on April 29, 2009 at 6:30 p.m.
  - Meeting located at the Town of Hastings Town Hall
  - Representatives of interested jurisdictions, agencies, groups, and the public were invited to attend
  - During this meeting, Ron Raymond, NYSOEM Region IV, gave a presentation on mitigation, the Disaster Mitigation Act of 2000, FEMA's role, and the reasons municipalities should participate in the process. John Condino, Barton & Loguidice, also presented a brief slideshow detailing how the mitigation plan will be developed and what the role of municipalities and partner agencies will be throughout the planning process.
  - Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office (Pat Egan, Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County Office of Real Property (Steve Smith), NYSOEM (Ron Raymond), Town of Constantia (John Metzger, Richard Colesante), Town of Hastings (Linda House), Town of Mexico (C. Hadwin Fravor), Town of West Monroe (Gary Ross), Village of Central Square (Millard Murphy), Central Square Fire Company (Gary House, Dennis Hotaling, Kenneth Hotaling), Village of Cleveland (Joe Domachowske, Malchoff Davis), Village of Parish (Neil Chatterton, Pat Lewis), City of Oswego (Joseph Perry), Barton & Loguidice (John Condino, Johanna Duffy)
  - Requirement met: 201.6(c)(1)

- **Kick-off Meeting #3 (Northern Working Group)**
  - Held on April 30, 2009 at 6:30 p.m.
  - Meeting located at the Snow Memorial Building in the Village of Pulaski
  - Representatives of interested jurisdictions, agencies, groups, and the public were invited to attend
  - During this meeting, Ron Raymond, NYSOEM Region IV, gave a presentation on mitigation, the Disaster Mitigation Act of 2000, FEMA's role, and the reasons municipalities should participate in the process. John Condino, Barton & Loguidice, also presented a brief slideshow detailing how the mitigation plan will be developed and what the role of municipalities and partner agencies will be throughout the planning process.
  - Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office (Pat Egan, Terry Bennett), Oswego County Legislature (Paul Santore, Margaret Kastler), Oswego County Department of Community Development, Tourism, and Planning (Kelly Jordal), NYSOEM (Ron Raymond), National Grid (V. Ladd-deGraff, Town of Albion (Nancy Sheeley), Town of Boylston (Frederick Potter), Town of Richland (Sue Haynes, Kern Yerdon), Town of Sandy Creek (Nancy Ridegway), City of Fulton (Anthony Gorea), Village of Lacona (Peggy Manchester), Village of Pulaski (Ernie Wheeler, Donna Archer), Barton & Loguidice (John Condino, Johanna Duffy)
  - Requirement met: 201.6(c)(1)

- **Participation and Point of Contact Letters**
  - Sent May 1, 2009
  - Letter sent to municipalities who attended the kick-off meetings asking them to designate a point of contact for their jurisdiction for the project
  - Letter sent to the Supervisors and Mayors of 13 Municipalities who did not participate in the kick-off meetings to again invite them to take part in the process
  - Requirement met: 201.6(b) (2)&(3)
- **Participation Letter III**
  - Sent May 8, 2009
  - Form letter written and sent to County Administrators and Chairmen and Chairwomen of the Legislature to sign and send to the 11 Municipalities who still hadn't responded to the previous two participation letter requests
  - Requirement met: 201.6(b) (2)&(3)
- **Planning Meeting – all groups**
  - Held on May 14, 2009
  - Meeting located at the Joint Information Center in the City of Fulton
  - Presentation by John Condino outlining the steps to put together a Hazard Mitigation Plan for the County
  - The dates for the first round of working group meetings were agreed upon
  - Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office (Pat Egan, Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County

Sheriff's Office (Robert Lighthall), NYSOEM (Ron Raymond), Town of Albion (Nancy Sheeley), Town of Amboy (Dave Holst), Town of Boylston (Frederick Potter), Town of Constantia (John Metzger), Town of Hastings (Linda House), Town of Redfield (Francis Adams), Town of Richland (Kern Yerdon, Ron Crandall, Sue Haynes), Town of Sandy Creek (Nancy Ridegway), Town of Scriba (Brad Coe, Terry Smith), Town of West Monroe (Gary Ross), City of Fulton (Dan O'Brien), City of Oswego (Joseph Perry), Village of Central Square (Linda House), Village of Lacona (Peggy Manchester), Village of Parish (Pat Lewis, Neil Chatterton), Village of Pulaski (Donna Archer, Ernie Wheeler), Village of Sandy Creek (Allen Bradberry, Grant Rohrmoser), Oswego County Soil and Water Conservation District (SWCD) (John DeHollander), City of Oswego Fire Department (Joseph Perry), City of Fulton Fire Department (Anthony Gorea), and North Shore Council of Governments (Paul Baxter), Barton & Loguidice (John Condino, Johanna Duffy)

- Requirement met: 201.6(c)(1)

- **Working Group Meetings, Round 1 (Central Working Group)**
  - Held on May 21, 2009 at 6:30 p.m.
  - Meeting located at the Town of Hastings Town Hall
  - Meeting participants were provided a map of their jurisdiction on which to locate and label critical facilities
  - Participants were provided with and shown how to fill out FEMA worksheets 2, 3a, 3b
  - Jurisdictions/Groups represented: Oswego County Emergency Management Office (Terry Bennett), Oswego County Department of Community Development, Tourism,

and Planning (Donna Scanlon, Karen Noyes), Town of Amboy (Dave Holst), Town of Constantia (John Metzger), Town of Hastings (Linda House, Kenneth Hotaling), Town of Mexico (C. Hadwin Fravor), Town of New Haven (Debra Allen), Town of Parish (Steve Stelmashuck, Fred Swartz), Town of West Monroe (Gary Ross), Village of Central Square (Ken Sherman), Village of Parish (Neil Chatterton, Pat Lewis), North Shore Council of Governments (Paul Baxter), and Hastings Fire Department (Neal Turo)

- Requirement met: 201.6(b) (2)&(3)

- **Oswego County Hazard Analysis Session**
  - Held on May 29, 2009 at 8:00 a.m.
  - Meeting located at the Joint Information Center
  - This session was facilitated by Ron Raymond and Tom McCartney of NYSOEM Region IV
  - Participants worked to rank hazards that could potentially affect Oswego County using the HIRA-NY hazard analysis program
  - Jurisdictions/Groups/Agencies represented: Oswego County Emergency Management Office (Pat Egan, Terry Bennett, Renee Ingham), Oswego County Legislature (Paul Santore), Oswego County Sheriff's Office (Robert Lighthall), Oswego County Highway Department (Chris Baldwin, Kurt Ospelt), Oswego County Office of Real Property (Steve Smith, David Hastings), Oswego County Department of Community Development, Tourism, and Planning (Dave Turner, Martin Weiss, Donna Scanlon, Karen Noyes), Oswego County Department of Health (Evan Walsh, Judy Lester), Oswego County Soil and Water Conservation District (John

DeHollander), Oswego County Administrator's Office (Phil Church), Oswego County Fire Coordinator (John Hinds), Barton & Loguidice (John Condino, Johanna Duffy), Village of Pulaski (Ernie Wheeler), Town of Richland (Ron Crandall), Constellation Energy (John Kaminski), National Weather Service (Judy Levan), Town of Mexico (C. Hadwin Fravor), Brookfield Renewable Power (Steve Murphy), RACES (John Darling), and NYSOEM Region IV (Ronald Raymond, Tom McCartney)

- Requirement met: 201.6 (c)(2)(i)

- **Working Group Meetings, Round 1 (Northern Working Group)**
  - Held on June 2, 2009 at 6:30 p.m.
  - Meeting located at the Snow Memorial Building
  - Meeting participants were provided a map of their jurisdiction on which to locate and label critical facilities
  - Participants were provided with and shown how to fill out FEMA worksheets 2, 3a, 3b
  - Jurisdictions/Groups represented: Oswego County Emergency Management Office (Pat Egan, Terry Bennett), Town of Albion (Nancy Sheeley), Town of Boylston (Fred Potter), Town of Orwell (Marilyn Roser), Town of Redfield (Francis Adams), Town of Richland (Kern Yerdon, Ron Crandall, Sue Haynes), Town of Sandy Creek (Nancy Ridegway), Village of Lacona (Peggy Manchester), Village of Pulaski (Ernie Wheeler, Donna Archer), Village of Sandy Creek (Grant Rohrmoser), Sandy Creek Fire Department (Don Norton), and Lacona Volunteer Fire Department (Kim Crast), Barton & Loguidice (John Condino)
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Participation Letter IV**
  - Sent June 3, 2009
  - Letter to Supervisors or Mayors of 8 Municipalities who hadn't responded regarding their participation in the mitigation plan
  - Information detailing the last opportunity (June 9th meeting) to attend the first round of working group sessions was provided
- **Working Group Meetings, Round 1 (Southern Working Group)**
  - Held on June 9, 2009 at 6:30 p.m.
  - Meeting located at the Sheriff's Office Building in the City of Oswego
  - Meeting participants were provided a map of their jurisdiction on which to locate and label critical facilities
  - Participants were provided with and shown how to fill out FEMA worksheets 2, 3a, 3b
  - Jurisdictions/Groups represented: Oswego County Emergency Management Office (Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County Sheriff's Office (Robert Lighthall), Oswego County Office of Real Property (Steve Smith), Oswego County Department of Community Development, Tourism, and Planning (Karen Noyes, Dave Turner), Town of Hannibal (Ronald Greenleaf), Town of Scriba (Brad Coe), Town of Volney (Edward Wavle), City of Fulton (Anthony Gorea, Dan O'Brien), City of Oswego (Joseph Perry), Village of Cleveland (Deborah Kite), Village of Hannibal (Joe Caruana), SUNY Oswego (Jeff Grimshaw), Barton & Loguidice (John Condino), City of Oswego Fire

Department (Joseph Perry), City of Fulton Fire Department (Anthony Gorea)

- Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Local Working Group Meeting (Towns of Oswego and Volney)**
  - Held on June 10, 2009
  - Terry Bennett met with representatives from the Town of Oswego and the Town of Volney to answer questions and assist them with the completion of their 3a and 3b forms
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Local Working Group Meeting (Town of Hastings and Village of Central Square)**
  - Held on June 14, 2009
  - John Condino met with representatives from the Town of Hastings and the Village of Central Square to answer questions and assist them with the completion of their 3a and 3b forms
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Local Working Group Meeting (Town of Richland and Village of Pulaski)**
  - Held on June 17, 2009
  - Terry Bennett met with representatives from the Town of Richland and the Village of Pulaski to answer questions regarding the FEMA forms
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Local Working Group Meeting (Town of Granby)**
  - Held on June 18, 2009
  - Terry Bennett met with the Town of Granby representative to assist with the completion of 3a and 3b forms
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Local Working Group Meeting (Towns of Orwell, Redfield, and Sandy Creek and Villages of Sandy Creek and Lacona)**
  - Held on June 19, 2009
  - Terry Bennett met with representatives from the Town of Orwell and the Town of Redfield, and then subsequently with the Town of Sandy Creek, Village of Sandy Creek, and Village of Lacona, to assist with the completion of the 3a and 3b forms
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Working Group Meetings, Round 2 (Central Working Group)**
  - Held on June 24, 2009 at 6:30 p.m.
  - Meeting located at the Town of Hastings Mallory Elementary School
  - Assistance was provided to participating jurisdictions with their 3a and 3b forms
  - Jurisdictions/Groups represented: Oswego County Emergency Management Office (Terry Bennett), Town of Amboy (Dave Holst), Town of Constantia (Richard Colesante), Town of Hastings (Linda House), Town of Parish (Fred Swartz, Steve Stelmashuck), Village of Central Square (Millard Murphy, Mike Avery), Village of Cleveland (Deborah Kite), Village of Parish (Neil Chatterton, Pat Lewis), and

Village of Central Square School District (Paul Brissette), Barton & Loguidice (John Condino, Johanna Duffy)

- Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Working Group Meetings, Round 2 (Northern Working Group)**
  - Held on June 30, 2009 at 6:30 p.m.
  - Meeting located at the Snow Memorial Building
  - Assistance was provided to participating jurisdictions with their 3a and 3b forms
  - Jurisdictions/Groups represented: Oswego County Emergency Management Office (Terry Bennett), Oswego County Legislature (Margaret Kastler), Town of Albion (Nancy Sheeley), Town of Boylston (Fred Potter), Town of Orwell (Marilyn Roser), Town of Redfield (Francis Adams, Tanya Yerdon), Town of Richland (Sue Haynes, Ron Crandall, Kern Yerdon), Town of Sandy Creek (Paulette Lindsey, Nancy Ridgeway), Town of Williamstown (John Hamblin), Village of Altmar (Corey Holcomb), Village of Lacona, Village of Pulaski (Donna Archer, Ernie Wheeler), Village of Sandy Creek (Allen Bradberry, Grant Rohrmoser), Barton & Loguidice (John Condino)
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Working Group Meetings, Round 2 (Southern Working Group)**
  - Held on July 7, 2009
  - Meeting located at the Oswego County Sheriff's Office
  - Assistance was provided to participants with their 3a and 3b forms
  - Brainstormed locations where data might be located to aid in form completion

- Jurisdictions/Groups represented: Oswego County Emergency Management Office (Terry Bennett, Pat Egan), Oswego County Legislature (Paul Santore), Oswego County Office of Real Property (Steve Smith), Oswego County Department of Community Development, Tourism, and Planning (Martin Weiss), Town of Hannibal (Rita Hooper, Virginia Wilbur), Town of Oswego (Greg Herrmann, Dan Shaver), Town of Scriba (Brad Coe), City of Fulton (Anthony Gorea, Dan O'Brien), City of Oswego (Joseph Perry), SUNY Oswego (Jeff Grimshaw), Village of Hannibal (Joe Caruana), Barton & Loguidice (John Condino, Johanna Duffy), City of Oswego Fire Department (Joseph Perry), City of Fulton Fire Department (Anthony Gorea), Town of Oswego Fire Department (Dan Shaver)
- Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Mini Working Group Session for Northern and Central Groups**
  - Held on July 14, 2009
  - Extra assistance was provided to participating jurisdictions
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Town of Boylston (Fred Potter), Village of Altmar (Corey Holcomb), Town of Albion (Nancy Sheeley), Town of Williamstown (Chip Hamblin), Town of Mexico (C. Hadwin Fravor), Village of Lacona (Kim Crast), Town of New Haven (Debra Allen), Lacona Fire Department (Kim Crast), Oswego County Fairgrounds (Fred Potter), Barton & Loguidice (John Condino, Johanna Duffy)
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Local Working Group Meeting (Town and Village of Parish)**
  - Held on July 20, 2009
  - Terry Bennett met with representatives from the Town and Village of Parish to assist them with the completion of their 3a and 3b worksheets
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Oswego County Critical Facilities Meeting**
  - Held on July 21, 2009
  - Meeting located at the Emergency Management Office
  - County representatives were invited to put together a critical facility inventory for Oswego County. Discussion focused on critical County buildings and facilities, emergency services locations, sites of large populations such as SUNY Oswego, energy producers, industries with hazardous material on-site, and transportation facilities, etc.
  - Agencies and County departments represented at this meeting include: Oswego County Emergency Management Office (Terry Bennett), Oswego County Department of Community Development, Tourism, and Planning (Martin Weiss), Constellation Energy (Sue Giddings), Oswego County Highway Department (Kurt Ospelt, Chris Baldwin), Oswego County Soil and Water Conservation District (John DeHollander), Oswego County Department of Health (Evan Walsh), RACES, NYSOEM Region IV (Ron Raymond), Oswego County Office of Real Property (Steve Smith), Barton & Loguidice (John Condino, Johanna Duffy)
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Working Group Meetings, Round 3 (Northern Working Group)**
  - Held on July 21, 2009
  - Meeting located at the Snow Memorial Building
  - Questions were answered regarding the completion of worksheets and the next steps of the process were outlined and discussed
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Town of Orwell (Marilyn Roser), Town of Sandy Creek (Nancy Ridgeway), Village of Lacona (Peggy Manchester), Village of Pulaski (Ernie Wheeler), Town of Richland (Ron Crandall), and Village of Sandy Creek (Allen Bradberry, Grant Rohrmoser), Barton & Loguidice (John Condino, Johanna Duffy)
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Working Group Meetings, Round 3 (Central Working Group)**
  - Held on July 22, 2009
  - Meeting located at the Parish Town Gym in the Village of Parish
  - Questions were answered regarding the completion of worksheets and the next steps of the process were outlined and discussed
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Town of Hastings (Linda House), Village of Central Square (Kenneth Hotaling), Town of Constantia (Richard Colesante, John Metzger), Town of Parish (Fred Swartz), Village of Parish (Pat Lewis, Neil Chatterton, Leon Heagle), Town of Mexico (C. Hadwin Fravor), Village of Mexico (James Hotchkiss), Town of West

Monroe (Paul Baxter), and North Shore Council of Governments (Paul Baxter), Central Square Fire Department (Dennis Hotaling, Gary House), Central Square School District (Paul Brissette), Barton & Loguidice (John Condino, Johanna Duffy)

- Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Local Working Group Meeting (Towns of Boylston and Orwell)**
  - Held on July 27, 2009
  - Terry Bennett met with representatives from the Towns of Boylston and Orwell to assist them in the completion of their 3a and 3b worksheets
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Local Working Group Meeting (Village of Hannibal)**
  - Held on August 4, 2009
  - Terry Bennett met with representatives from the Village of Hannibal to assist them in the completion of their mitigation worksheets
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Working Group Meetings, Round 3 (Southern Working Group)**
  - Held on August 4, 2009
  - Meeting located at the Oswego County Sheriff's Office
  - Questions were answered regarding the completion of worksheets and the next steps of the process were outlined and discussed
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County Office of Real

Property (Steve Smith), City of Oswego (Joseph Perry), Town of Granby (Dave Edwards), Town of Scriba (Brad Coe), Town of Hannibal (Ron Greenleaf), City of Oswego Fire Department (Joseph Perry), Barton & Loguidice (John Condino)

- Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)

- **Mini Working Group Session for Central Working Group**
  - Held on August 12, 2009
  - Meeting located at the Town of Hastings Town Hall
  - Assistance was provided to participants regarding the completion of their 3a and 3b forms
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Oswego County Legislature, Oswego County Sheriff's Office, Oswego County Highway Department, Oswego County Office of Real Property, Oswego County Department of Community Development, Tourism, and Planning, Town of Constantia (Richard Colesante), Town of Hastings (Linda House, Kenneth Hotaling), Town of Mexico (C. Hadwin Fravor), Town of Parish (Fred Swartz), Village of Central Square, Village of Mexico (James Hotchkiss), Village of Parish (Neil Chatterton), and North Shore Council of Governments (Paul Baxter), Barton & Loguidice (Johanna Duffy)
  - Requirements met: 201.6 (c)(2)(i) and 201.6 (c)(2) (ii) & (iii)
- **Working Group Meetings, Round 4 (Northern Working Group)**
  - Held on August 18, 2009
  - Meeting located at the Snow Memorial Building

- Second phase of project started: John Condino outlined the process to develop mitigation goals and objectives for the mitigation plan. Participants were assigned to brainstorm potential mitigation projects for next meeting.
- Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Town of Albion (Carl Anson, Jr.), Town of Boylston (Fred Potter), Town of Orwell (Marilyn Roser), Town of Richland (Ron Crandall, Kern Yerdon), Town of Sandy Creek (Nancy Ridgeway, Paulette Lindsey), Village of Lacona (Peggy Manchester), Village of Pulaski (Ernie Wheeler, Donna Archer), Oswego County Fairgrounds (Fred Potter), and Village of Sandy Creek (Allen Bradberry, Grant Rohrmoser), Barton & Loguidice (John Condino)
- Requirements met: 201.6 (c)(3) (i) and (ii)

- **Working Group Meetings, Round 4 (Southern Working Group)**
  - Held on August 25, 2009
  - Meeting located at Oswego County Sheriff's Office
  - Second phase of project started: John Condino outlined the process to develop mitigation goals and objectives for the mitigation plan. Participants were assigned to brainstorm potential mitigation projects for next meeting.
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County Sheriff's Office (Robert Lighthall), Oswego County Office of Real Property (Steve Smith), Town of Granby (Dave Edwards), Town of Scriba (Brad Coe), City of Fulton (Dan O'Brien), Town of Hannibal (Ron Greenleaf), SUNY Oswego (Jeff Grimshaw),

Town of Oswego (Dan Shaver), City of Oswego (Joseph Perry), Village of Hannibal (Joe Caruana), and North Shore Council of Governments (Paul Baxter), Barton & Loguidice (John Condino and Johanna Duffy), City of Oswego Fire Department (Joseph Perry), Town of Oswego Fire Department (Dan Shaver)

- Requirements met: 201.6 (c)(3) (i) and (ii)

- **Working Group Meetings, Round 4 (Central Working Group)**
  - Held on September 2, 2009
  - Meeting located at the Town of Hastings Town Hall
  - Second phase of project started: John Condino outlined the process to develop mitigation goals and objectives for the mitigation plan. Participants were assigned to brainstorm potential mitigation projects for next meeting.
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Village of Central Square (Millard Murphy), Town of Hastings (Kenneth Hotaling, Linda House, Jim Weatherup), Town of Constantia (John Metzger), Village of Parish (Neil Chatterton), Village of Cleveland (Deborah Kite), Town of New Haven (Debra Allen), Town of Mexico (C. Hadwin Fravor), Town of Parish (Fred Swartz), and Central Square Fire Department (Dennis Hotaling), Barton & Loguidice (John Condino)
  - Requirements met: 201.6 (c)(3) (i) and (ii)

- **Working Group Meetings, Round 5 (Northern Working Group)**
  - Held on September 15, 2009
  - Meeting located at the Snow Memorial Building

- Committee began to outline specific mitigation measures that could be implemented to reduce the impacts of particular hazards that affect their jurisdictions and the County. The date, time, and location for a public meeting in the northern section of Oswego County were set.
- Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Town of Albion (Nancy Sheeley, Carl Anson, Jr.), Town of Boylston (Fred Potter), Town of Orwell (Marilyn Roser), Town of Redfield (Tanya Yerdon), Town of Richland (Sue Haynes), Town of Sandy Creek (Nancy Ridgeway, Paulette Lindsey), Village of Lacona (Peggy Manchester), Village of Pulaski (Ernie Wheeler), Village of Sandy Creek (Grant Rohrmoser, Allen Bradberry), Barton & Loguidice (John Condino, Johanna Duffy), Oswego County Fairgrounds (Fred Potter)
- Requirements met: 201.6 (c)(3) (ii) and (iii)

- **Working Group Meetings, Round 5 (Central Working Group)**
  - Held on September 29, 2009
  - Meeting located at the Town of Hastings Town Hall
  - Committee began to outline specific mitigation measures that could be implemented to reduce the impacts of particular hazards that affect their jurisdictions and the County. The date, time, and location for a public meeting in the central section of Oswego County were set.
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Town of Constantia (Richard Colesante), Town of Hastings (Kenneth Hotaling, Jim Weatherup, Linda House), Town of Mexico (C. Hadwin Fravor), Town of West Monroe (Gary Ross, Paul Baxter),

Village of Central Square (Millard Murphy), Village of Cleveland (Deborah Kite), Village of Mexico (James Hotchkiss), North Shore Council of Governments (Paul Baxter), Central Square Fire Department (Dennis Hotaling), Barton & Loguidice (John Condino, Johanna Duffy)

- Requirements met: 201.6 (c)(3) (ii) and (iii)

- **Working Group Meetings, Round 5 (Southern Working Group)**
  - Held on September 30, 2009
  - Meeting located at the Oswego County Sheriff's Office
  - Committee began to outline specific mitigation measures that could be implemented to reduce the impacts of particular hazards that affect their jurisdictions and the County. The date, time, and location for a public meeting in the southern section of Oswego County were set.
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Oswego County Legislature (Paul Santore), Oswego County Sheriff's Office, Oswego County Highway Department, Oswego County Office of Real Property, Oswego County Department of Community Development, Tourism, and Planning, Town of Hannibal (Ron Greenleaf), City of Fulton (Anthony Gorea), Town of Scriba (Brad Coe), Town of Volney (Edward Wavle), City of Oswego (Joseph Perry), Town of Oswego (Dan Shaver), City of Oswego Fire Department (Joseph Perry), Village of Hannibal (Joe Caruana), Barton & Loguidice (John Condino), City of Fulton Fire Department (Anthony Gorea), Town of Oswego Fire Department (Dan Shaver)
  - Requirements met: 201.6 (c)(3) (ii) and (iii)

- **Public Meeting (Northern Section)**
  - Held October 20, 2009
  - Meeting located at the Snow Memorial Building
  - John Condino presented on the mitigation planning process and where the County stood in the process thus far. The list of mitigation measures that the working groups had brainstormed was presented to the public. Public comments and suggestions were accepted.
  - Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office, Oswego County Legislature, Oswego County Sheriff's Office, Oswego County Highway Department, Oswego County Office of Real Property, Oswego County Department of Community Development, Tourism, and Planning, Town of Orwell, Village of Sandy Creek, Town of Richland, Town of Sandy Creek, Village of Lacona, Town of Boylston, Village of Pulaski, Town of Redfield, Town of Williamston, Town of Albion, Lacona Volunteer Fire Department, Oswego County Fairgrounds, Barton & Loguidice
  - Total present: 25
  - Requirements met: 201.6 (c)(1), 201.6 (c)(3) (ii) and (iii)
- **Public Meeting (Central Section)**
  - Held on October 28, 2009
  - Meeting located at the Town of Hastings Town Hall
  - John Condino presented on the mitigation planning process and where the County stood in the process thus far. The list of mitigation measures that the working groups had

brainstormed was presented to the public. Public comments and suggestions were accepted.

- Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office, Oswego County Legislature, Oswego County Sheriff's Office, Oswego County Highway Department, Oswego County Office of Real Property, Oswego County Department of Community Development, Tourism, and Planning, NYSOEM, Village of Cleveland, Town of Hastings, Village of Parish, Town of New Haven, Village of Central Square, Town of Parish, Town of Mexico, Central Square Fire Department, Hastings Fire Department, Barton & Loguidice
- Total present: 35
- Requirements met: 201.6 (c)(1), 201.6 (c)(3) (ii) and (iii)

- **Public Meeting (Southern Section)**
  - Held on November 4, 2009
  - Meeting located at the Sheldon Hall Ballroom on the SUNY Oswego Campus
  - John Condino presented on the mitigation planning process and where the County stood in the process thus far. The list of mitigation measures that the working groups had brainstormed was presented to the public. Public comments and suggestions were accepted.
  - Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office, Oswego County Legislature, Oswego County Sheriff's Office, Oswego County Highway Department, Oswego County Office of Real Property, Oswego County Department of Community Development, Tourism, and Planning, NYSOEM, City of

Oswego, Town of Oswego, Operative Engineers Union, City of Oswego Fire Department, City of Fulton, Village of Hannibal, Town of Minetto, Town of Volney, SUNY Oswego, Oswego County Opportunities, Barton & Loguidice

- Total present: 24
- Requirements met: 201.6 (c)(1), 201.6 (c)(3) (ii) and (iii)

- **Working Group Meetings, Round 6 (Central Working Group)**
  - Held on March 30, 2010
  - Meeting located at the Town of Hastings Town Hall
  - STAPLEE forms were distributed to each jurisdiction to fill out and instructions were provided on how to complete the STAPLEE forms. The STAPLEE forms consisted of nine pages of 65 initial mitigation actions and required the jurisdictions to prioritize and review the implementation of each proposed action that was deemed applicable to their community. Six National Flood Insurance Program (NFIP) mitigation actions were included on a separate STAPLEE form, but the prioritization criteria and process was the same. In addition, the jurisdictions were asked to brainstorm at least specific mitigation action that was applicable to their community for inclusion in the plan. The date, time, and location for a County-wide public meeting to inform the public of the plan progress was also presented.
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Barton & Loguidice (John Condino), Town of Constantia (Richard Colesante), Town of Hastings (Jim Weatherup, Linda House), Town of Mexico (C. Hadwin Fravor), Village of Central Square (Millard Murphy), Village of Mexico (James Hotchkiss),

Central Square Fire Department (Scott House) Village of Parish (Neil Chatterton), Barton & Loguidice (John Condino, Johanna Duffy)

- o Requirements met: 201.6 (c)(3) (iii)

- **Working Group Meetings, Round 6 (Southern Working Group)**
  - o Held on April 6, 2010
  - o Meeting located at the Oswego County Sheriff's Office
  - o STAPLEE forms were distributed to each jurisdiction to fill out and instructions were provided on how to complete the STAPLEE forms. The STAPLEE forms consisted of nine pages of 65 initial mitigation actions and required the jurisdictions to prioritize and review the implementation of each proposed action that was deemed applicable to their community. Six National Flood Insurance Program (NFIP) mitigation actions were included on a separate STAPLEE form, but the prioritization criteria and process was the same. In addition, the jurisdictions were asked to brainstorm at least specific mitigation action that was applicable to their community for inclusion in the plan. The date, time, and location for a County-wide public meeting to inform the public of the plan progress was also presented.
  - o Jurisdictions represented: Oswego County Emergency Management Office (Pat Egan), former Oswego County Legislature (Paul Santore), Oswego County Legislature (Linda Lockwood), Oswego County Sheriff's Office (Robert Lighthall), Oswego County Office of Real Property (Steve Smith), Town of Volney (Edward Wavle), City of Oswego (Joseph Perry), Town of Oswego (Greg Herrmann), City of Oswego Fire Department (Joseph Perry), Village of Hannibal

(Joe Caruana), Barton & Loguidice (John Condino, Johanna Duffy), Town of West Monroe (Paul Baxter)

- Requirements met: 201.6 (c)(3) (iii)

- **Working Group Meetings, Round 6 (Northern Working Group)**
  - Held on April 7, 2010
  - Meeting located at the Snow Memorial Building
  - STAPLEE forms were distributed to each jurisdiction to fill out and instructions were provided on how to complete the STAPLEE forms. The STAPLEE forms consisted of nine pages of 65 initial mitigation actions and required the jurisdictions to prioritize and review the implementation of each proposed action that was deemed applicable to their community. Six National Flood Insurance Program (NFIP) mitigation actions were included on a separate STAPLEE form, but the prioritization criteria and process was the same. In addition, the jurisdictions were asked to brainstorm at least specific mitigation action that was applicable to their community for inclusion in the plan. The date, time, and location for a County-wide public meeting to inform the public of the plan progress was also presented.
  - Jurisdictions represented: Oswego County Emergency Management Office (Terry Bennett), Town of Orwell (Marilyn Roser), Town of Redfield (Tanya Yerdon, Francis A. Adams), Town of Richland (Sue Haynes, Dawn Holynski, Ron Crandall), Town of Sandy Creek (Nancy Ridgeway), Village of Lacona (Peggy Manchester), Village of Pulaski (Ernie Wheeler), Salmon River Council of Governments (Paul Baxter), Barton & Loguidice (John Condino, Johanna Duffy)

- Requirements met: 201.6 (c)(3) (iii)

- **Public Meeting (All)**
  - Held April 21, 2010
  - Meeting located at Rich Hall on SUNY Oswego Campus
  - A brief powerpoint presentation outlining each section of the hazard mitigation plan was provided, including a general summary of the whole process completed to date. The report due dates and subsequent review steps were discussed. Jurisdiction representatives were reminded to think of a mitigation action specific to their community.
  - Jurisdictions/Agencies/Groups represented: Oswego County Emergency Management Office, Oswego County Legislature, Oswego County Soil and Water Conservation District, Oswego County Department of Community Development, Tourism, and Planning, Town of Richland, Village of Pulaski, Town of Mexico, City of Oswego, Town of Oswego, Barton & Loguidice
  - Total present: 14
  - Requirements met: 201.6 (c)(1), 201.6 (c)(3) (ii) and (iii)

Table 17 illustrates the frequent and continued participation of all jurisdictions that would be included in this Multi-Jurisdictional Hazard Mitigation Plan for Oswego County. Representatives of each participating jurisdiction, as well as the public, have been and will continue to be given a chance to review the draft plan and will be encouraged to submit comments. Jurisdiction representatives will be in charge of making sure that the other residents and members of their jurisdiction(s) are given a chance to review the draft mitigation plan and of making sure that the draft plan is easily accessible to the public. The

plan maintenance requirement (Phase 4) of DMA 2000 is detailed in Section 9 of this document.

Table 17 outlines only the meeting attendance of the participating jurisdictions. If a jurisdiction could not provide representation to a particular meeting, they completed the activities and met the goals and objectives of that meeting through alternate means. The objectives were met using conference calls, emails, and website access to resources and information.

Table 17 – Summary of Meeting Participation

Summary of the participation of jurisdiction to be included in the Multi-Jurisdictional Hazard Mitigation Plan for Oswego County. Mini Work Group Sessions and Local Working Group Meetings were held for those would needed assistance with their forms or had questions regarding the hazard mitigation process.

Hazard	Kick-off Meetings (4/23, 4/29, 4/30/2009)	Planning Meeting (all groups – 5/14/2009)	Working Groups, Round 1 (5/21, 6/2, 6/9/2009)	Local Working Group Meetings	Working Groups, Round 2 (6/24, 6/30, 7/7/2009)	Mini Work Group Sessions	Working Groups, Round 3 (7/21, 7/22, 8/4/2009)	Working Groups, Round 4 (8/18, 8/25, 9/2/2009)	Working Groups, Round 5 (9/15, 9/29, 9/30/2009)	Working Groups Round 6 (3/30, 4/6, 4/7/2010)
Town of Albion	X	X	X		X	X		X	X	
Village of Altmar					X	X				
Town of Amboy		X	X		X					
Town of Boylston	X	X	X	X	X	X		X	X	
Village of Central Sq	X	X	X	X	X	X	X	X	X	X
Village of Cleveland	X		X		X			X	X	
Town of Constantia	X	X	X		X	X	X	X	X	X
City of Fulton	X	X	X		X			X	X	
Town of Granby		X		X			X	X		
Town of Hannibal	X		X		X		X	X	X	
Village of Hannibal	X	X	X	X	X			X	X	X
Town of Hastings	X	X	X	X	X	X	X	X	X	X
Village of Lacona	X	X	X	X	X	X	X	X	X	X
Town of Mexico	X		X			X	X	X	X	X
Village of Mexico						X	X		X	X
Town of Minetto*										
Town of New Haven			X			X		X		
Town of Orwell		X	X	X	X		X	X	X	X
Town of Oswego	X			X	X			X	X	X
City of Oswego	X	X	X		X		X	X	X	X
Town of Palermo*										

Table 17 – Summary of Meeting Participation

Summary of the participation of jurisdiction to be included in the Multi-Jurisdictional Hazard Mitigation Plan for Oswego County. Mini Work Group Sessions and Local Working Group Meetings were held for those would needed assistance with their forms or had questions regarding the hazard mitigation process.

Hazard	Kick-off Meetings (4/23, 4/29, 4/30/2009)	Planning Meeting (all groups – 5/14/2009)	Working Groups, Round 1 (5/21, 6/2, 6/9/2009)	Local Working Group Meetings	Working Groups, Round 2 (6/24, 6/30, 7/7/2009)	Mini Work Group Sessions	Working Groups, Round 3 (7/21, 7/22, 8/4/2009)	Working Groups, Round 4 (8/18, 8/25, 9/2/2009)	Working Groups, Round 5 (9/15, 9/29, 9/30/2009)	Working Groups Round 6 (3/30, 4/6, 4/7/2010)
Town of Parish		X	X	X	X	X	X	X		
Village of Parish	X		X	X	X	X	X	X		X
Village of Phoenix*										
Village of Pulaski	X	X	X	X	X		X	X	X	X
Town of Redfield		X	X	X	X				X	X
Town of Richland	X	X	X	X	X		X	X	X	X
Town of Sandy Creek	X	X	X	X	X		X	X	X	X
Village of Sandy Creek	X	X	X	X	X		X	X	X	
Town of Schroeppel*										
Town of Scriba	X	X	X		X		X	X	X	
Town of Volney			X	X					X	X
Town of West Monroe	X	X	X				X		X	X
Town of Williamstown					X	X				
Oswego County	X	X	X	X	X	X	X	X	X	X

*Denotes a non-participating jurisdiction

4.0 Hazard Ranking

Oswego County is vulnerable to numerous natural and technological hazards. These hazards were ranked using the automated program HIRA-NY. The selections made in HIRA-NY are based on information entered into preformatted Microsoft Excel spreadsheets recommended by FEMA and NYSOEM. The HIRA-NY risk assessment process identified all hazards that may potentially impact Oswego County and detailed a handful of the most prevalent and higher ranking hazards. In order to complete the risk assessment, consideration was given to details like location or geographic area that could be affected, extent or magnitude of each hazard, previous occurrences, and probability of future occurrences.

Within the HIRA-NY program, there are 5 factor areas where the answers provided during the risk assessment directly impact the ultimate hazard rankings. These 5 factor areas are denoted and detailed below (HIRA-NY).

Scope

This factor looks at two aspects of hazard scope: what area or areas in your jurisdiction could be impacted by the hazard and what are the chances of the hazard triggering another hazard causing a cascade effect. A cascade effect is when the onset of one hazard triggers the effects of another, or multiple, hazard(s). Once the potential area of impact is determined, one of the following options is selected in the HIRA-NY program:

- *A single location* – several hazards can impact a single location.
- *Several individual locations* – many hazards are capable of impacting several individual locations. This does not mean that the hazards occur simultaneously at these locations, but that they could occur at one or several locations at the same time.

- *Throughout a small region* – where a single location or several individual locations actually comprise a significant area, the impact area should be classified as throughout a small region.
- *Throughout a large region* – a larger region would extend for miles and comprise a significant portion of the community begin assessed.

The next part of the scope factor is to determine whether the hazard could potentially trigger another hazard. There are many hazards that trigger the occurrence of additional hazards. When assessing this factor, evaluate various severity levels including a credible worst-case scenario. The options for the cascading effect potential of a hazard are as follows:

- *No, highly unlikely.*
- *Yes, some potential.*
- *Yes, highly likely.*

Frequency

Frequency indicates how often a hazard has resulted in an emergency or disaster, or can be a prediction of how often a hazard may occur in the future. The frequency of a hazard should not be based on the worst-case scenario, but rather how often an event would cause various types of damage to the community that would require activation of the emergency response forces. History is a good indicator of the potential for future events and should be reviewed before determining the frequency of a hazard. The HIRA-NY program provides the following options when deciding the frequency of a hazard event:

- *A rare event* – occurs less than once every 50 years.
- *An infrequent event* – occurs between once every 8 years and once every 50 years (inclusive).

- *A regular event* – occurs between once a year and once every 7 years (inclusive).
- *A frequent event* – occurs more than once a year.

Impact

The impact of a hazard should be assessed on various severity levels, including a credible worst-case scenario. There are three types of impacts that are included in the HIRA-NY program: impacts on the population, impacts on private property, and impacts on community infrastructure.

The first impact type concerns the ability of a hazard to seriously injure or kill people. How might this hazard impact the population?

- *Serious injury or death is unlikely* – a serious injury is one that would require immediate medical attention, without which the injured person's life or limb is threatened.
- *Serious injury or death is likely, but not in large numbers* – this determination should apply when the casualties of a hazard can be adequately treated through the normal operation of a community's emergency medical system.
- *Serious injury or death is likely in large numbers* – this determination should apply when the number of casualties requires a full or near full activation of a community's medical facilities' disaster plans.
- *Serious injury or death is likely in extremely large numbers* – this option denotes a catastrophe and applies when the numbers of casualties overwhelms the local emergency medical system and substantial outside assistance is required.

The second impact type concerns the potential for a hazard to physically or economically damage private property, including industrial structures, homes and contents, commercial businesses, belongings, and income in a community. The list and

type of private property that may be impacted will vary based on the characteristics of the community. The HIRA-NY options to denote a hazard's impact on private property include:

- *Little or no damage*
- *Moderate damage*
- *Severe damage*

Beyond the actual classification of the impact on private property as little or none, moderate, or severe, the risk assessment process requires the identification of precise types and numbers of properties and structures that have the potential to be impacted.

The third impact type is related to the potential for a hazard to specifically cause structural damage to the infrastructure that serves the community, including government buildings, roads, bridges, and public utility lines, plants, and substations. The options provided in HIRA-NY to indicate a hazards impact on the community infrastructure include:

- *Little or no structural damage*
- *Moderate structural damage*
- *Severe structural damage*

As with private property, the above classification of damage should be supported by detailed information regarding the type of public property likely to be impacted.

Onset

The onset factor is related to the amount of time between the initial recognition of an approaching hazard and when the hazard begins to impact the community. This is a very important factor because for some hazards ample warning time is available so that if plans and procedures have not been developed, there is still time to accomplish such

tasks. Other hazards provide no warning, so the response to a hazard event depends on existing plans, if any. The choices for time of onset are:

- *No warning*
- *Several hours warning*
- *One day warning*
- *Several days warning*
- *A week or more warning*

For a few hazards there may be different warning times depending on location. In this case, use the shortest warning time that is credible and associated with a credible worst-case event.

Duration

There are two types of duration analyzed in the HIRA-NY program: how long does the hazard remain active and how long do emergency operations continue after the hazard event has ended. A third duration addressed in HIRA-NY, but not included in a community's hazard analysis report, is how long it takes the community to fully recover from the hazard event. The recovery process continues until the community returns to normal. The options provided by HIRA-NY for the duration of the hazard are:

- *Less than one day*
- *One day*
- Two to three days
- Four days to a week
- More than one week

The HIRA-NY program offers the following options for recovery time of a community after a hazard event:

- Less than one day

- One to two days
- Three days to one week
- One week to two weeks

4.1 Oswego County Hazard Assessment

On May 29, 2009, a group of County and local officials and representatives was assembled in order to complete a HIRA-NY risk assessment process for the County. Oswego County previously completed the HAZNY risk assessment program in January 2000. It was determined that the results of this event needed to be updated as part of the County's Hazard Mitigation Plan. NYSOEM Region IV personnel facilitated the May 2009 event, recording the final results of the HIRA-NY program. The following individuals represented a variety of County and non-County departments and stakeholders at this event:

- NYSOEM Region IV – Ronald Raymond, Tom M^{c}Cartney
- Oswego County Legislature – Paul Santore
- Constellation Energy Group – John Kaminski
- National Weather Service – Judy Levan
- Oswego County Highway Department – Chris Baldwin, Kurt Ospelt
- Oswego County Emergency Management Office – Terry Bennett, Patricia Egan, Renee Ingham
- Oswego County Department of Community Development, Tourism, and Planning – Dave Turner, Karen Noyes, Martin Weiss, Donna Scanlon
- Oswego County Office of Real Property – Steve Smith, David Hastings
- Oswego County Fire Coordinator – John Hinds
- Oswego County Administrator's Office – Phil Church
- Brookfield Renewable Power – Steve Murphy

- Oswego County Soil and Water Conservation District – John DeHollander
- RACES – John Darling
- Oswego County Department of Health – Evan Walsh, Judy Lester
- Oswego County Sheriff's Office – Robert Lighthall
- Barton & Loguidice – John Condino, Johanna Duffy
- Village of Pulaski – Ernie Wheeler
- Town of Richland – Ron Crandall
- Town of Mexico – C. Hadwin Fravor

Based on the professional knowledge of those present, historical County data, and discussions that occurred amongst the group, 20 hazards were assessed and ranked using the HIRA-NY program. These 20 hazards and their ratings are included in Table 2 in Section 1.3.3. The County's top three rated hazards are severe storm, ice storm, and utility failure.

The individuals present for the County's HIRA-NY process determined the severity of impacts for the 20 selected hazards based on the five factors discussed in Section 4.0: scope, frequency, impact, onset, and duration. Table 18 details the selections that were made for these five factors in relation to each of the 20 analyzed hazards.

Table 18 – HIRA-NY Risk Assessment Rating Characteristics

Scope, frequency, impact, onset, and duration results for the 20 hazards analyzed as part of Oswego County's HIRA-NY risk assessment completed on May 29, 20009.

Hazard	Rating	Scope	Cascade Effects	Frequency	Onset	Hazard Duration	Recovery Time
Severe storm	289	Throughout a large region	Some potential	A frequent event	No warning	Less than one day	Three days to one week
Ice storm	257	Throughout a large region	Highly likely	A regular event	Several days warning	Two to three days	More than two weeks
Utility failure	254	Throughout a large region	Highly likely	A regular event	No warning	Two to three days	Less than one day
Earthquake	246	Throughout a large region	Highly likely	An infrequent event	No warning	Less than one day	One to two weeks
Hazmat (in transit)	242	Throughout a large region	Some potential	A regular event	No warning	One day	Three days to one week
Terrorism	239	Throughout a small region	Some potential	An infrequent event	No warning	Less than one day	More than two weeks
Tornado	237	Throughout a large region	Highly likely	A regular event	No warning	Less than one day	One to two days
Flood	234	Several locations	Highly likely	A regular event	Several hours warning	Two to three days	Three days to one week
Dam failure	232	Throughout a large region	Highly likely	A rare event	No warning	Less than one day	More than two weeks
Fire	223	Throughout a large region	Some potential	A regular event	No warning	One day	One to two days
Wildfire	217	Throughout a small region	Some potential	A regular event	No warning	Less than one day	One to two days
Winter storm (severe)	208	Throughout a large region	Some potential	A regular event	Several day warning	Four days to one week	Three days to one week
Epidemic	204	Throughout a large region	Some potential	An infrequent event	More than one week warning	More than one week	More than two weeks
Hazmat (fixed site)	204	Several locations	Some potential	A regular event	No warning	Less than one day	Less than one day
Ice jam	204	Several locations	Some potential	A regular event	Several hours warning	Two to three days	One to two days
Coastal storm	203	Throughout a large region	Highly likely	A regular event	Several days warning	Two to three days	One to two days

Table 18 – HIRA-NY Risk Assessment Rating Characteristics
Scope, frequency, impact, onset, and duration results for the 20 hazards analyzed as part of Oswego County's HIRA-NY risk assessment completed on May 29, 20009.

Hazard	Rating	Scope	Cascade Effects	Frequency	Onset	Hazard Duration	Recovery Time
Extreme temps	190	Throughout a large region	Some potential	A regular event	Several days warning	Two to three days	Less than one day
Landslide	171	Throughout a large region	Some potential	A rare event	No warning	Two to three days	Three days to one week
Drought	164	Throughout a large region	Some potential	An infrequent event	More than one week warning	More than one week	Three days to one week
Radiological (fixed site)	145	Throughout a small region	Some potential	A rare event	Several hours warning	Less than one day	More than two weeks

4.2 Single and Multi-Jurisdiction Hazard Assessment

Specific communities within the County may be more likely to experience certain hazards over others, resulting in different levels of impacts, frequency, duration, and community recovery time than the entire County. The Oswego County EMO has been working with independent jurisdictions to assist them in completing similar analysis for their jurisdictions, some using the HIRA-NY program.

Single jurisdiction risk assessments that have been completed by jurisdictions within Oswego County are included in Appendix B. All participating jurisdictions aided in the completion and review of the County's HIRA risk assessment which was completed in support of this hazard mitigation plan. The County's risk assessment results were used to put this plan together, not the results of the single jurisdiction assessments.

The County's three highest rated hazards, severe storm, ice storm, and utility failure, are fairly common amongst the highest rated hazards for each local community. It is important to understand that these numbers serve to approximate the risks associated with each hazard. The extent of risk varies

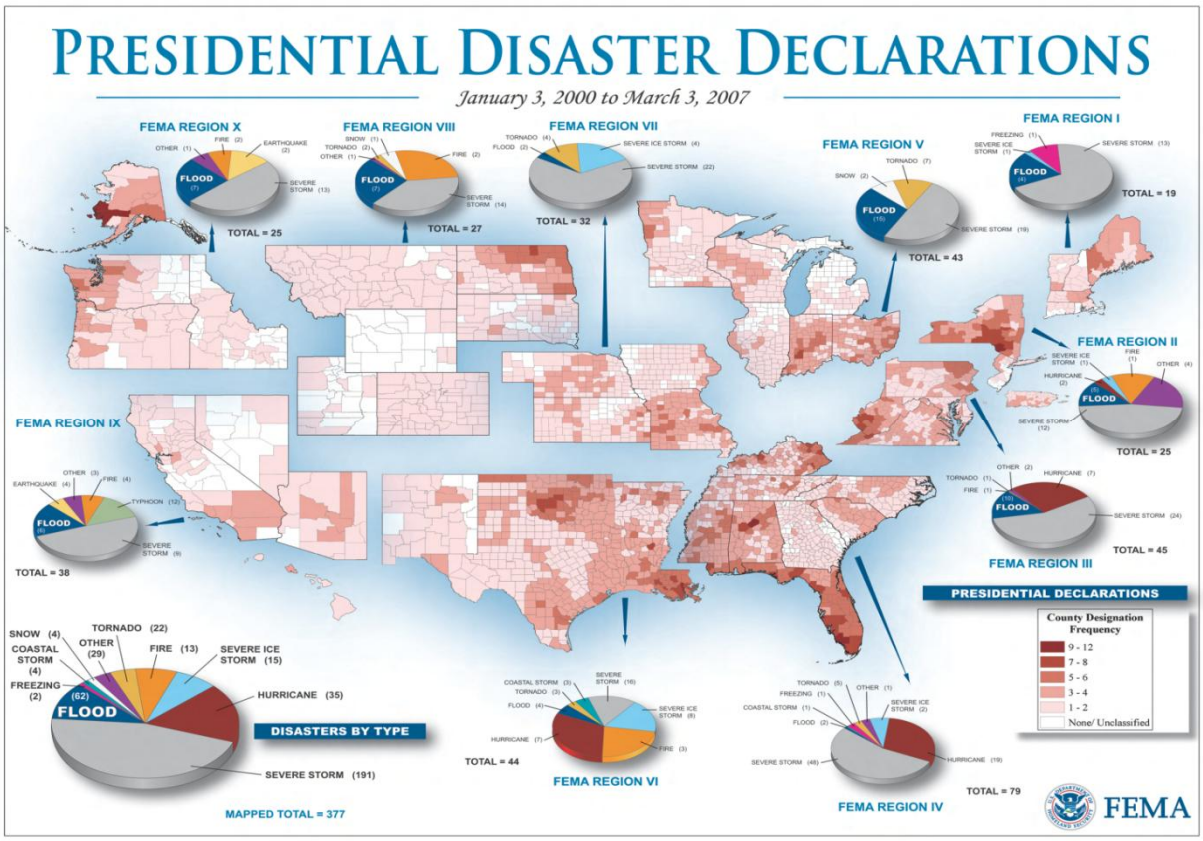
depending on the group of individuals present during such an exercise and the health and safety issues current at the time the assessment is completed. Though the majority of communities within Oswego County have completed risk assessments, none of them have previously completed local hazard mitigation plans; therefore, all participating jurisdictions are included in the Oswego County multi-jurisdiction hazard mitigation plan.

Based on the highest rated hazards identified by the County HIRA risk assessment event, objectives were suggested and a mitigation plan was formulated in order to minimize the potential loss and impact of these hazards. These objectives and mitigation strategies are documented in Section 8.0 of this report.

4.3 Presidential Disaster Declaration

After a state has declared a State Disaster Area, as the result of a particular disaster event, that state and its local governments will evaluate recovery options, capabilities, and costs. If the damage from the disaster event is beyond the recovery capabilities of the state, the governor will send a letter to the President, through FEMA, detailing the situation. The president then makes the decision whether to declare a major disaster or emergency. After a presidential declaration is made, FEMA designates the impacted area eligible for assistance and announces the types of assistance available. FEMA provides supplemented assistance for the recovery of state and local governments; the federal share will always be at least 75 percent of the total eligible costs (FEMA, Presidential Disaster Declarations, 2009). Figure 4.1 shows the different regions of FEMA located within the United States and the total presidential declarations that have been issued for each Region between January 3, 2000 and March 3, 2007.

Figure 4.1 – Shows the numbers and hazards associated with the Presidential Disaster Declarations for each Region of FEMA within the United States, issued between January 3, 2000 and March 3, 2007
(FEMA, Presidential Disaster Declarations, 2009)



5.0 Hazard and Vulnerability Assessment

5.1 Hazards Determined to not Affect Oswego County

During the HIRA-NY analysis, the County felt that certain hazards did not need to be included due to their low probability to occur within Oswego County and their low historic occurrence and low future probability. The hazards that were not included are: avalanche, hurricane, infestation, severe thunderstorm, tsunami, air contamination, civil unrest, explosion, food shortage, fuel shortage, mine collapse, oil spill, radiological – in transit, structural collapse, transportation accident, and water supply contamination. Avalanche, hurricane, and tsunami were not included in the HIRA-NY hazard analysis due to their irrelevance based on Oswego County's location within New York State. The topography of the County is fairly flat with gently rolling hills, not a location that is apt to be affected by avalanches. Due to the County's distant location from any oceans (approximately 250-miles from the Atlantic Ocean), the probability of being directly impacted by a tsunami or hurricane is very unlikely. These hazard events are not historically documented to have occurred at any point within Oswego County.

In the HIRA-NY program used by the County, Severe Thunderstorms are incorporated in the Severe Storm definition (as are Hail Storms and High Wind events). After discussing whether to assess Severe Thunderstorms as a separate hazard, the consensus of the group was to follow the HIRA-NY definition and incorporate Severe Thunderstorms in the Severe Storm category.

Infestation is defined in the HIRA-NY program as an excessive population of insects, rodents, or other animals requiring control measures due to their potential to carry diseases, destroy crops, or harm the environment. Oswego County personnel and agency representatives determined that because there was no historical evidence showing that this hazard has occurred within the

County, or has caused much damage, the potential for such an event was determined to be rare and this hazard was not included in the analysis.

The remaining 11 hazards that were determined to not be applicable to Oswego County are technological hazards. Technological hazards can be addressed in hazard mitigation plans; however, the focus remains on the natural hazards that may affect Oswego County. Though these 11 hazards could occur within the County, the potential is low and there is no recorded history of these hazards frequently occurring.

The 20 natural and technological hazards analyzed as part of this plan are detailed in Sections 6.0 and 7.0. Each hazard is profiled to indicate its probability of occurrence and documentation of historical events within or affecting Oswego County.

5.2 Vulnerability Assessment

A vulnerability assessment is completed in order to provide a quantitative estimate of the people and property in each jurisdiction that may be susceptible to a particular hazard event. Costs associated with a hazard's potential to impact people and property were estimated for the highest ranking natural and technological hazards in each jurisdiction. The completion of this assessment utilizes estimates and assumptions of damages and costs and that should be viewed as the worst-case scenario for each hazard. The estimated costs and damages can be used for cost-benefit comparisons that are helpful in justifying the expenses of mitigation projects and land-use restrictions. It is important to remember that the vulnerability assessments are largely based on estimates and assumptions. Actual hazard events have the potential to incur greater or lesser losses and impacts than what the results of the vulnerability assessments indicate. The cost estimates put together to assess hazard vulnerability are not exhaustive and may not encompass all damages that could occur as a result of a hazard event.

To aid in this exercise, the total number of parcels in each participating jurisdiction were quantified based on the following land use types: agricultural, residential, commercial, community services, industrial, public services, forested land, and vacant land. This information is included in Table 19. Additionally, the total property values of all lands within each participating jurisdiction were also estimated by the Oswego County Office of Real Property. This information was helpful during the inventory of assets step of the hazard mitigation planning process. Information regarding the total property values is included in Table 20.

Table 19 – Number of parcels per jurisdiction or jurisdictions included in certain land use categories (Oswego County Office of Real Property)

Jurisdiction(s)	Agriculture	Residential	Commercial	Education	Religious	Government	Industrial	Utilities	Vacant Land	Total
Town of Albion Village of Altmar	23	739	34	1	3	13	1	3	502	**1,319**
Town of Amboy	24	620	7	0	3	4	0	2	376	**1,036**
Town of Boylston	11	343	1	0	2	2	0	2	169	**530**
Town of Constantia Village of Cleveland	5	2,049	56	4	16	6	7	13	630	**2,786**
City of Fulton	0	3,392	375	10	18	13	19	25	413	**4,265**
Town of Granby	101	2,206	75	1	8	2	10	12	644	**3,059**
Town of Hannibal Village of Hannibal	73	1,452	64	1	5	3	5	5	425	**2,033**
Town of Hastings Village of Central Square	32	2,545	129	3	9	3	8	21	738	**3,488**
Town of Mexico Village of Mexico	63	1,826	93	12	11	7	12	17	646	**2,687**
Town of New Haven	22	1,210	21	1	4	1	0	3	334	**1,596**
Town of Orwell	16	698	5	1	4	2	3	10	394	**1,133**
City of Oswego	1	5,495	629	14	26	16	18	47	746	**6,992**
Town of Oswego	14	1,597	55	11	8	2	2	10	448	**2,147**
Town of Parish Village of Parish	8	944	38	4	6	6	0	8	347	**1,361**
Town of Redfield	0	589	18	0	2	3	3	1	355	**971**
Town of Richland Village of Pulaski	57	2,099	235	5	16	5	13	27	822	**3,279**
Town of Sandy Creek Village of Sandy Creek	96	2,084	99	3	7	6	7	16	709	**3,027**

Table 19 – Number of parcels per jurisdiction or jurisdictions included in certain land use categories (Oswego County Office of Real Property)

Jurisdiction(s)	Agriculture	Residential	Commercial	Education	Religious	Government	Industrial	Utilities	Vacant Land	Total
Village of Lacona										
Town of Scriba	40	2,122	108	0	6	6	6	43	583	**2,914**
Town of Volney	43	1,986	67	2	5	3	20	39	598	**2,763**
Town of West Monroe	11	1,403	46	0	2	2	1	4	375	**1,844**
Town of Williamstown	26	566	23	2	3	2	5	5	285	**917**
Oswego County	**817**	**40,438**	**2,343**	**87**	**177**	**117**	**168**	**349**	**11,652**	**56,148**

Table 20 – Total value of properties located within each participating jurisdiction (Oswego County Office of Real Property)

Jurisdiction(s)	Value ($)
Town of Albion / Village of Altmar	$64,268,150
Town of Amboy	$52,051,604
Town of Boylston	$25,389,900
Town of Constantia / Village of Cleveland	$270,062,039
City of Fulton	$428,716,132
Town of Granby	$226,018,815
Town of Hannibal / Village of Hannibal	$145,884,365
Town of Hastings / Village of Central Square	$317,277,306
Town of Mexico / Village of Mexico	$248,356,395
Town of New Haven	$119,034,829
Town of Orwell	$139,946,265
City of Oswego	$957,712,492
Town of Oswego	$228,283,625
Town of Parish / Village of Parish	$81,686,699
Town of Redfield	$35,885,816
Town of Richland / Village of Pulaski	$265,716,672
Town of Sandy Creek / Village of Sandy Creek / Village of Lacona	$250,165,276
Town of Scriba	$2,096,705,034
Town of Volney	$254,257,253
Town of West Monroe	$6,801,077
Town of Williamstown	$46,827,900
Oswego County	**$6,804,505,011**

5.2.1 Inventory of Assets

Representatives from each participating jurisdiction mapped the critical facilities for their Town or Village on a large map depicting the tax parcel boundaries, roadways, large water bodies, school locations, and dam locations. Critical facilities such as post offices, municipal buildings, municipal highway garages, cell towers, police stations, fire departments, National Grid properties, etc. were labeled for each participating jurisdiction to be used as a reference to help determine the potential impacts of each hazard. The representatives then estimated the number of structures, value of structures, and number of people for different occupancy classes (residential, commercial, industrial, agricultural, religious/non-profit, government, education, and utilities) within their jurisdiction. These estimates were analyzed for each hazard that may affect the community; some hazards were grouped together on one sheet if they constituted similar impacts or areas to the community. The above estimates included: for number of structures – the number within the jurisdiction as a whole, the number within the hazard area, and the percentage within the hazard area; for value of structures – the total value of all structures within the jurisdiction, the value of all structures within the hazard area, and the percentage of value within the hazard area; and for the number of people, the total number in the jurisdiction, the total number in the hazard area, and the percentage within the hazard area. One of these worksheets was completed for each participating jurisdiction, for each potential hazard included as part of the analysis. The Town and Village of Parish and the Town of Hastings and the Village of Central Square partnered for this exercise, coordinating together to estimate one set of inventory assets for their combined jurisdictions.

Once each participating jurisdiction's assets were generally inventoried, an additional worksheet was completed by each jurisdiction to

identify the specific critical facilities and assets that could be potentially damaged by each type of hazard event. Detailed information for each asset included size of building, replacement value, contents value, function use or value, displacement cost, and occupancy or capacity. This worksheet forced each jurisdiction to take a harder look at which sets would be impacted based on which potential hazards could occur. Not only were the critical community assets for each jurisdiction identified, monetary values associated with damage to each asset were also estimated. This information was fundamental for determining hazard mitigation strategies for each hazard. The asset identification and vulnerability worksheets that each jurisdiction completed as part of this process are included as Appendix E.

5.2.2 Future Development

Currently, there are no County-owned development plans anticipated within Oswego County. The only large privately proposed development plan known at this time is an expansion project at the SUNY Oswego campus. Any future developments within the County will be compared to the goals and objectives stated in this plan, which will be linked to the Comprehensive Plans and Land Use Plans of all applicable jurisdictions within the County for use by the Town/Village Boards and Planning/Zoning Boards. The County hopes that documents like the Hazard Mitigation Plan will assist the local jurisdictions in implementing informed residential planning and development reviews to limit the amount of construction activities within known hazard areas.

6.0 Natural Hazards

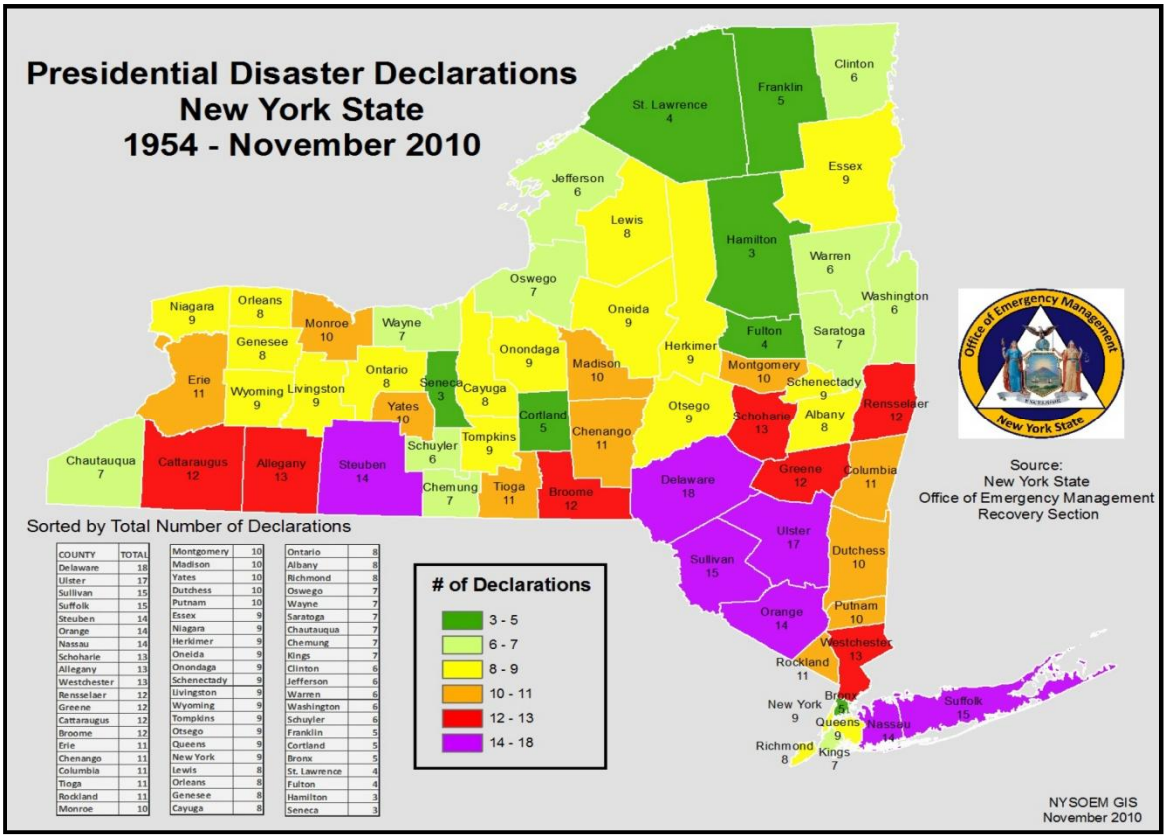
According to Figure 6.1, below, Oswego County has experienced a total of seven (7) Presidential Disaster Declarations between 1954 and 2010. According to NYSOEM and FEMA records, the Presidential Disaster Declarations that included Oswego County are:

- Ice storm (DR-1467), 2003
- Terrorist Attack (DR-1391), 2001, statewide
- Flooding – Northern New York (DR-733), 1985
- Hurricane Eloise (DR-487), 1975
- Severe storms and flooding (DR-447), 1974
- High winds, wave action and flooding (DR-367), 1973
- Tropical Storm Agnes (DR-338), 1972

In addition, five (5) Emergency Declarations have been issued between 1974 and 2010 that have included Oswego County. These Emergency Declarations are as follows:

- Lake effect snowstorms (EM-3273), 2007
- New York Hurricane Katrina evacuation (EM-3262), 2005, statewide
- Lake effect storm (EM-3195), 2004
- Power outage (EM-3186), 2003
- New York virus threat (West Nile) (EM-3155), 2000, statewide

Figure 6.1 – Total Presidential Disaster Declarations for natural hazards, displayed at the County level, 1954 – 2010
(NYSOEM, 2011 NYS Hazard Mitigation Plan)



COUNTY	TOTAL
Delaware	18
Ulster	17
Sullivan	15
Suffolk	15
Steuben	14
Orange	14
Nassau	14
Schoharie	13
Allegany	13
Westchester	13
Rensselaer	12
Greene	12
Cattaraugus	12
Broome	12
Erie	11
Chenango	11
Columbia	11
Tioga	11
Rockland	11
Monroe	10

Montgomery	10
Madison	10
Yates	10
Dutchess	10
Putnam	10
Essex	9
Niagara	9
Herkimer	9
Oneida	9
Onondaga	9
Schenectady	9
Livingston	9
Wyoming	9
Tompkins	9
Otsego	9
Queens	9
New York	9
Lewis	8
Orleans	8
Genesee	8
Cayuga	8

Ontario	8
Albany	8
Richmond	8
Oswego	7
Wayne	7
Saratoga	7
Chautauqua	7
Chemung	7
Kings	7
Clinton	6
Jefferson	6
Warren	6
Washington	6
Schuyler	6
Franklin	5
Cortland	5
Bronx	5
St. Lawrence	4
Fulton	4
Hamilton	3
Seneca	3

The natural hazards that were evaluated as part of the County's HIRA-NY analysis are further detailed below. This information includes a risk assessment of the hazard, a description of the hazard, historical occurrences of each hazard within Oswego County, and the probability of future hazard events and associated losses. During the HIRA-NY analysis, the participants rated each hazard based on the group's assessment and assigned numerical values associated with the significance of each hazard. These hazards are discussed in the order that they were categorized, from high hazard events to low hazard events.

Additional information was compiled from local records, the National Weather Service (NWS), and the National Climatic Data Center (NCDC). The NCDC's data incorporates damage estimates, while local records do not. The NCDC's damage

estimates are subject to the NCDC's disclaimer that while the National Weather Service makes an effort to use the best available information to document the occurrence of storms and other significant weather data, some information may be unverified. To estimate damage amounts, the NWS makes a best guess using all available data. As a result, the property and crop damages listed for individual storms are considered a broad estimate. NCDC data used in this report is listed as such.

6.1 Severe Storm Hazard Profile

6.1.1 Hazard Description

This hazard could occur in any location within Oswego County, but would likely affect several individual locations during one event. Serious injury or death is likely due to this hazard's relationships to motor vehicle accidents, wind damage, or other cascading effects. A severe storm may also result in moderate damage to private property and public facilities.

Severe storms include hail storms, windstorms, and severe thunderstorms (with associated severe wind events such as derechos, gustnados, and downbursts). The National Weather Service (NWS) defines a severe thunderstorm as one with a tornado and/or surface hail ¾" or greater and/or wind gusts 50 knots (58 mph) or greater. Such storms can cause damage from wind, hail, heavy rainfall, and/or lightning strikes.

Thunderstorms

The National Weather Service (NWS) estimates that over 100,000 thunderstorms occur each year on the U.S. mainland. Approximately 10 percent are classified as "severe." Thunderstorms can produce deadly and damaging tornadoes, hailstorms, intense downburst and microburst winds, lightning, and flash floods. Thunderstorms spawn as many as

1,000 tornadoes each year as well. Since 1975, severe thunderstorms were involved in 327 Federal disaster declarations within the U.S. In the United States, an average of 300 people are injured and 80 people are killed each year by lightning. Flash flooding is responsible for more fatalities—more than 140 annually—than any other thunderstorm-associated hazard.

The duration of a thunder event is determined by measuring the time between the first peal of thunder and the last. The last peal of thunder is defined to be that which is followed by a period of at least 15 minutes without an additional peal. A "thunder day" is defined as any day in which at least one thunder peal is heard. Downburst winds are strong, concentrated, straight-line winds created by falling rain and sinking air that can reach speeds of 125 mph (200 km/h). Microburst winds are more concentrated than downbursts, with speeds up to 150 mph (240 km/h). Severe damage can result from the spreading out of downbursts and microbursts, which generally last 5 to 7 minutes. Due to wind shear and detection difficulties, they pose the biggest threat to aircraft departures and landings.

Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000ºF. The NWS classifies a thunderstorm as severe if its winds reach or exceed 58 mph (km/h), produces a tornado, or drops surface hail at least 0.75 in (1.91 cm) in diameter (FEMA, 1997). According to the U.S. Department of Commerce, 100-150 fatalities occurred in New York State between 1959 and 1993, as a result of lightning strikes.

For reference, a derecho is a widespread and long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms (Storm Prediction Center, "About Derechos"). A gustnado is a short-lived, ground-based vortex that develops on a gust front associated with either showers or thunderstorms (National Weather Service, 2009).

Windstorms

Wind is defined as the motion of air relative to the earth's surface. The horizontal component of the three-dimensional flow and the near-surface wind phenomenon are the most significant aspects of the hazard. Extreme windstorm events are associated with tropical cyclones, winter cyclones, and severe thunderstorms. Winds vary from zero at ground level to 200 mph (89 m/s) in the upper atmospheric jet stream at 6 to 8 mi (10 to 13 km) above the earth's surface. Large-scale extreme wind phenomena are experienced over every region of the United States and its territories. Figures 6.2 and 6.3 illustrate the wind zones mapped across the United States and New York State.

Figure 6.2 – Illustrates the locations of wind zones within the United States and denotes hurricane susceptible regions (FEMA, Wind Zones, 2009)

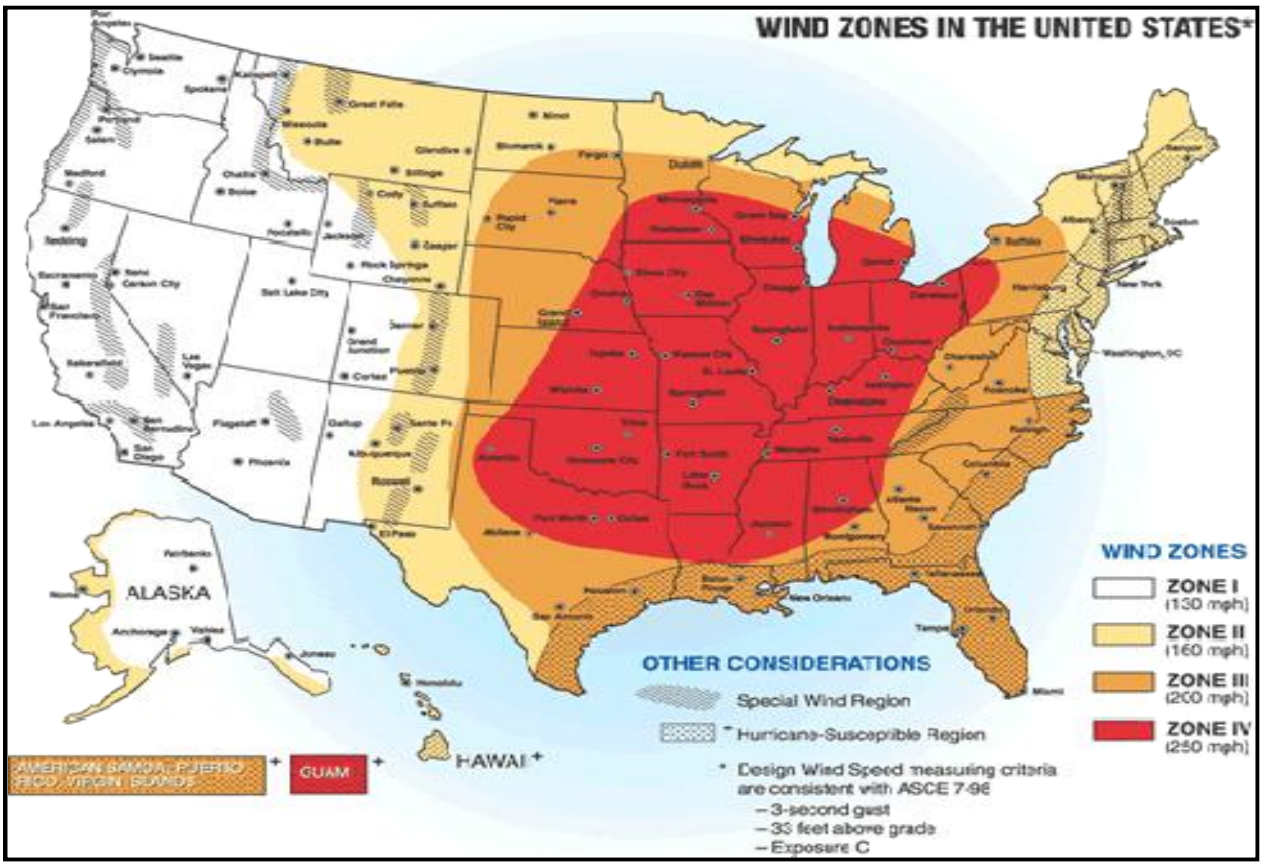
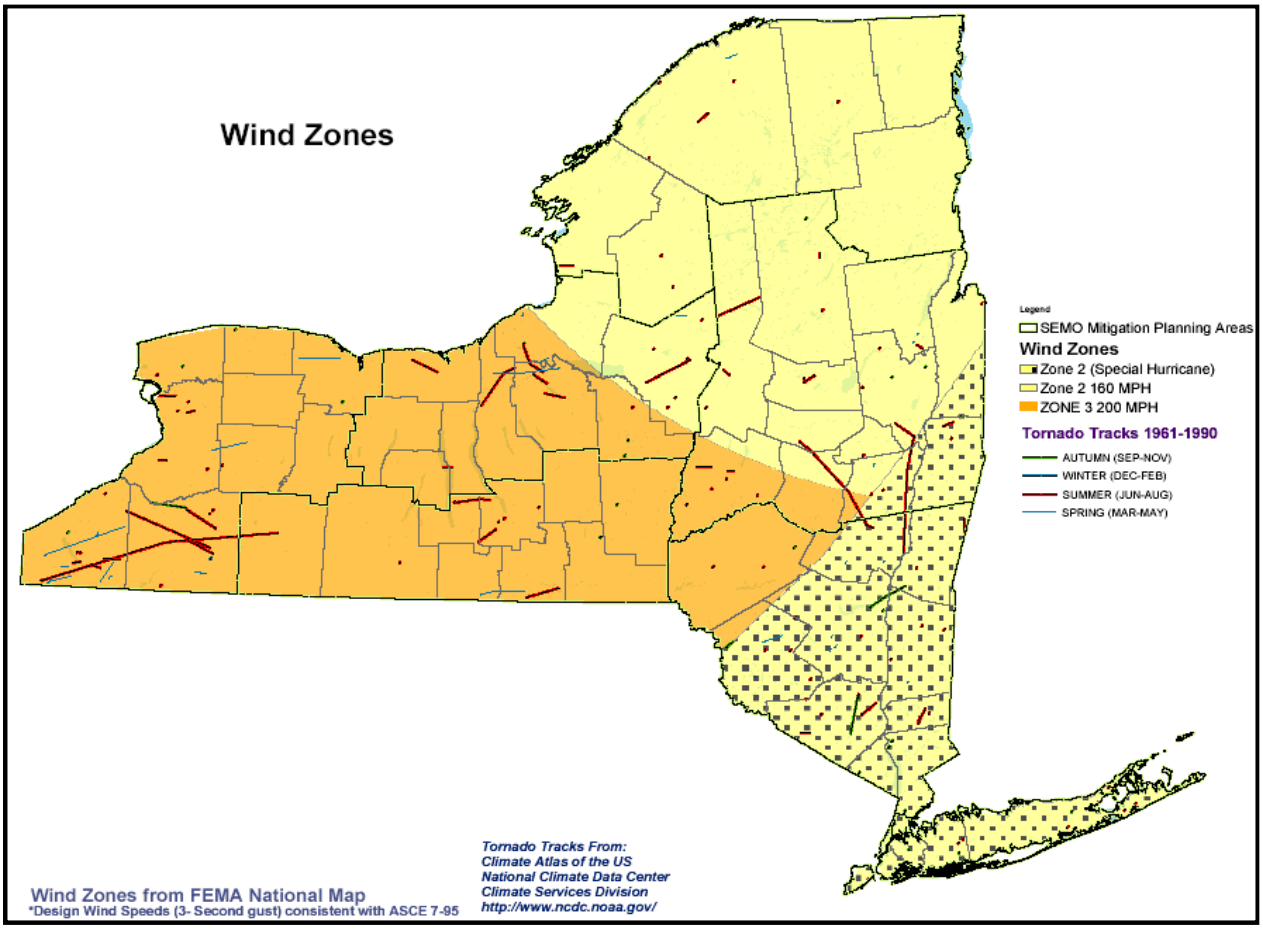


Figure 6.3 – Wind zones within New York State are depicted along with historical tornado tracks that occurred between 1961 and 1990
(FEMA, Tornadoes and Windstorms, June 2007)



Hailstorms

Hailstorms are often associated with severe thunderstorms. Hailstorms are characterized by the balls or irregularly shaped lumps of ice greater than 0.75 in (1.91 cm) in diameter which fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they reach a certain weight, after which they fall as precipitation. The size of hailstones is a direct function of the severity and size of the storm. High velocity updraft winds are

required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperatures at the surface increase the suspension time of hail in the thunderclouds and increase the size of the hailstones themselves (FEMA, 1997).

Peak periods for hailstorms are late spring and early summer, the time of year when the jet stream migrates northward across the U.S. Hailstorms can extensively damage agriculture crops, particularly those that are herbaceous and long-stemmed. Severe hailstorms can also cause damage to buildings and automobiles, but rarely cause fatalities or serious injury.

6.1.2 Geographic Location

While a severe storm might affect only a portion of the County, depending on its size and duration, such an event could anywhere within the County.

6.1.3 Historic Occurrences

Severe storm events have been documented within Oswego County, but none have been disastrous enough to require a Presidential Declaration of Disaster. In June 2008, a derecho struck the shoreline of Lake Ontario, requiring a local declaration of State of Emergency in the Town of Sandy Creek and the Villages of Sandy Creek and Lacona. Damage included a power outage that lasted for several days and downed trees and wires that blocked roadways. Along the shore of Lake Ontario, a golf course lost a number of trees and numerous summer camps and resorts were damaged.

The Labor Day Storm of 1998, occurring on September 7th, passed through the Village of Phoenix, resulting in a local declaration of State of Emergency. This event caused a power outage and damage from downed trees and wires, most notably in the Village of Phoenix.

On June 26, 2002, the Chairman of the Oswego County Legislature declared a County State of Emergency due to a series of severe weather that resulted in many downed trees and power lines. The damage from this storm event stretched from the City of Fulton to the Town of Redfield.

According to the National Climatic Data Center (NCDC), 191 thunderstorm and high wind events have been recorded for Oswego County between 1950 and May 31, 2009. Some of the major storms recorded by the NCDC include:

- May 16, 2009: Thunderstorms with strong damaging winds traveled from the Town of Granby to the Town of Williamstown, causing an estimated $10,000 in property damage;
- September 15, 2008: High winds, remnants of Hurricane Ike clocked at 57 knots, were documented within Oswego County. A storm surge estimated between 10-12 feet was documented at the east end of Lake Ontario. Two sailboats sunk in Oswego Harbor. The NCDC estimates that there was $250,000 in property damage associated with this storm event;
- June 10, 2008: A series of severe thunderstorms with high winds travelled across the Finger Lakes Region into Oswego County. These storms produced hail up to ¾" in diameter and wind gusts that neared 70 mph. These storms cause an overnight power outage for many communities, including the

Village of Phoenix, The Town and City of Oswego, and the Sandy Pond area in the Town of Sandy Creek. The Town of Sandy Creek locally declared a State of Emergency. The NCDC estimates a total of $220,000 in property damage occurred as a result of this storm series;

- November 13, 2003: Strong damaging winds travelled across Lake Ontario. A 165-foot tall cellular tower was toppled and multiple structures lost their roofs in the Town/City of Oswego;
- August 3, 2003: A thunderstorm downburst overturned three small, private planes at the Oswego County Airport in the Town of Volney. Trees and power lines were downed in the City of Fulton and the Town of Volney. A residential structure lost its roof in the Town of Granby. The NCDC estimates property damage for this storm at $250,000.

The NCDC was queried to determine the history of severe storm events that affected Oswego County between January 1, 1950 and August 31, 2009, according to the National Oceanic and Atmospheric Administration (NOAA). The results from this search are detailed in Table 21. The results of this query were limited to events where wind gusts met or exceeded 50 knots or hail was greater than 0.75 inches in diameter. These thresholds were ignored if an event resulted in property or crop damage and/or fatalities or injuries. Some results provided limited storm details and were therefore left out of the results table.

Table 21 – NOAA NCDC query results: historic severe storm events recorded for Oswego County, January 1950 – August 2009 (NOAA, NCDC, Storm Events Search, 2009)

Location	Date	Event	Magni-tude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
Oswego Co	7/24/75	Hail	0.75"	0	0	0	0
Oswego Co	6/16/76	Hail	0.75"	0	0	0	0
Oswego Co	6/19/76	T'storm Wind	53 knots	0	0	0	0
Oswego Co	6/26/76	T'storm Wind	52 knots	0	0	0	0
Oswego Co	9/11/78	Hail	1.75"	0	0	0	0
Oswego Co	9/11/78	T'storm Wind	52 knots	0	0	0	0
Oswego Co	6/16/83	Hail	1.75"	0	0	0	0
Oswego Co	8/6/84	Hail	1.75 "	0	0	0	0
Oswego Co	8/7/86	Hail	1.00"	0	0	0	0
Oswego Co	8/28/90	T'storm Wind	50 knots	0	0	0	0
Oswego Co	6/12/91	T'storm Wind	51 knots	0	0	0	0
Oswego Co	6/24/92	Hail	1.75"	0	0	0	0
Oswego Co	7/20/92	T'storm Wind	55 knots	0	0	0	0
(T) Redfield	5/15/93	Hail	1.00"	0	0	$50,000	0
Oswego Co	8/24/93	Hail	1.75"	0	0	$500,000	0
Oswego Co	8/24/93	T'storm Wind	Unk	0	0	$500,000	0
(T) Williamstown	8/24/93	T'storm Wind	Unk	0	0	$50,000	0
Oswego Co	8/24/93	Lightning	Unk	0	0	$50,000	0
Pulaski	8/31/93	T'storm Winds	Unk	0	0	$500,000	0
(T) Redfield	9/3/93	T'storm Winds	Unk	0	0	$5,000	0
(T) Schroeppel	5/26/94	Hail	1.00"	0	0	$5,000	0
(T) Constantia	5/26/94	Hail	0.75"	0	0	$5,000	0
(T/V) Parish	6/29/94	T'storm Winds	Unk	0	0	$5,000	0
Oswego Co	7/18/94	T'storm Winds	Unk	0	0	$5,000	0
(T) Minetto	7/25/94	Hail	1.00"	0	0	$5,000	0
(T) Granby	8/28/94	T'storm Winds	Unk	0	0	$50,000	0
I Fulton	8/28/94	T'storm Winds	Unk	0	0	$50,000	0
(T) Palermo	6/26/95	T'storm Winds	Unk	0	0	$4,000	0
(C/T) Oswego	7/6/95	T'storm Winds	Unk	0	0	$5,000	0
(C) Fulton	7/15/95	T'storm Winds	Unk	0	0	$10,000	0
(T) Hastings	8/3/95	T'storm Winds	Unk	0	0	$8,000	0
(C) Fulton	8/3/95	T'storm Winds	Unk	0	0	$6,000	0
(V) Central Sq	8/3/95	T'storm Winds	Unk	0	0	$5,000	0
(T/V) Hannibal	8/31/95	T'storm Winds	Unk	0	0	$8,000	0
(T) Scriba	8/31/95	T'storm Winds	Unk	0	0	$6,000	0
(V) Central Sq	7/25/96	Hail	1.75"	0	0	$2,000	0
(T/V) Mexico	7/25/96	T'storm Winds	Unk	0	0	$8,000	0
(V) Phoenix	7/15/97	T'storm Winds	Unk	0	0	$5,000	0
(C/T) Oswego	5/29/98	T'storm Winds	Unk	0	0	$10,000	0
(T) West Monroe	5/29/98	T'storm Winds	59 knots	0	0	$10,000	0
(T/V) Hannibal	5/31/98	T'storm Winds	Unk	0	0	$13,000	0
(C) Fulton	5/31/98	T'storm Winds	Unk	0	0	$10,000	0

Table 21 – NOAA NCDC query results: historic severe storm events recorded for Oswego County, January 1950 – August 2009 (NOAA, NCDC, Storm Events Search, 2009)

Location	Date	Event	Magni-tude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
(T/V) Mexico	8/23/98	T'storm Winds	Unk	0	0	$8,000	0
(V) Pulaski	8/23/98	T'storm Winds	Unk	0	0	$10,000	0
(T) New Haven	8/23/98	T'storm Winds	Unk	0	0	$7,000	0
(T/C) Oswego	8/23/98	T'storm Winds	51 knots	0	0	$12,000	0
(T) Constantia	8/23/98	T'storm Winds	Unk	0	0	$8,000	0
(V) Altmar	8/24/98	T'storm Winds	Unk	0	0	$12,000	0
(C) Fulton	8/24/98	Hail	1.00"	0	0	$13,000	0
(T/V) Hannibal	8/24/98	Hail	1.50"	0	0	$8,000	0
(V) Phoenix	9/7/98	T'storm Winds	Unk	0	0	$500,000	0
(V) Central Sq	9/26/98	T'storm Winds	Unk	0	0	$10,000	0
(T) Granby	7/3/99	T'storm Winds	Unk	0	0	$10,000	0
(T/V) Hannibal	7/3/99	T'storm Winds	Unk	0	0	$50,000	0
(V) Phoenix	7/6/99	T'storm Winds	Unk	0	0	$10,000	0
(T/C) Oswego	7/31/99	T'storm Winds	Unk	0	0	$25,000	0
(T) Williamstown	3/9/00	T'storm Winds	Unk	0	0	$20,000	0
(T/C) Oswego	3/9/00	Hail	0.75"	0	0	$15,000	0
(T) Volney	5/10/00	Hail	0.88"	0	0	$15,000	0
(T) Redfield	6/15/00	T'storm Winds	Unk	0	0	$8,000	0
(V) Pulaski	8/1/00	T'storm Winds	Unk	0	0	$20,000	0
(T) Hastings	8/1/00	T'storm Winds	Unk	0	0	$15,000	0
(T) Schroeppel	9/12/00	T'storm Winds	Unk	0	1	$20,000	0
(T) West Monroe	9/12/00	T'storm Winds	Unk	0	0	$10,000	0
Widespread	2/10/01	Wind Storm	66 knots	0	0	$2.9M	0
(T) Scriba	5/27/01	T'storm Wind	50 knots	0	0	$15,000	0
(T) West Monroe	5/27/01	T'storm Wind	58 knots	0	0	$35,000	0
(C) Fulton	7/24/01	T'storm Wind	50 knots	0	0	$8,000	0
(T/V) Hannibal	8/9/01	T'storm Wind	52 knots	0	0	$15,000	0
(T) Granby	8/19/01	T'storm Wind	52 knots	0	0	$12,000	0
(T) Volney	8/19/01	T'storm Wind	52 knots	0	0	$15,000	0
(T) Granby	8/31/01	T'storm Wind	55 knots	0	0	$28,000	0
Widespread	10/16/01	Wind Storm	64 knots	0	0	$35,000	0
(V) Lacona	5/21/02	T'storm Wind	50 knots	0	0	$25,000	0
(C) Fulton	6/26/02	T'storm Wind	60 knots	0	0	$50,000	0
(T) Volney	6/26/02	T'storm Wind	55 knots	0	0	$30,000	0
(T) Constantia	6/26/02	T'storm Wind	50 knots	0	0	$15,000	0
(T/V) Parish	6/27/02	T'storm Wind	50 knots	0	0	$10,000	0
(V) Altmar	6/27/02	T'storm Wind	51 knots	0	0	$10,000	0
(T/C) Oswego	6/27/02	T'storm Wind	54 knots	0	0	$20,000	0
(V) Central Sq	6/27/02	T'storm Wind	50 knots	0	0	$15,000	0
(V) Pulaski	7/22/02	T'storm Wind	50 knots	0	0	$10,000	0
(T) Volney	7/29/02	T'storm Wind	50 knots	0	0	$8,000	0
County Airport	8/16/02	T'storm Wind	68 knots	0	0	$20,000	0

Table 21 – NOAA NCDC query results: historic severe storm events recorded for Oswego County, January 1950 – August 2009 (NOAA, NCDC, Storm Events Search, 2009)

Location	Date	Event	Magni-tude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
(T) Palermo	9/3/02	T'storm Wind	50 knots	0	0	$8,000	0
Widespread	10/4/02	Wind Storm	51 knots	0	0	$65,000	0
(T/C) Oswego	5/11/03	T'storm Wind	50 knots	0	0	$35,000	0
(T/V) Mexico	7/4/03	T'storm Wind	50 knots	0	0	$10,000	0
(T) Granby	7/24/03	T'storm Wind	52 knots	0	0	$15,000	0
(C) Fulton	8/3/03	T'storm Wind	55 knots	0	0	$250,000	0
(T) Granby	8/3/03	T'storm Wind	55 knots	0	0	$35,000	0
(T) Constantia	8/5/03	T'storm Wind	50 knots	0	0	$10,000	0
(T/C) Oswego	8/29/03	T'storm Wind	50 knots	0	0	$10,000	0
(T/V) Mexico	8/29/03	T'storm Wind	52 knots	0	0	$10,000	0
(T/V) Parish	8/29/03	T'storm Wind	50 knots	0	0	$10,000	0
Widespread	11/13/03	Wind Storm	57 knots	1	2	0	0
(T/C) Oswego	4/29/04	Hail	0.75"	0	0	$5,000	0
(T/V) Parish	4/29/04	Hail	1.00"	0	0	$10,000	0
(T) West Monroe	5/24/04	T'storm Wind	50 knots	0	0	$15,000	0
(V) Altmar	7/1/04	Hail	1.00"	0	0	$5,000	0
(T) Granby	8/10/04	T'storm Wind	50 knots	0	0	$10,000	0
(V) Cleveland	8/29/04	Hail	1.75"	0	0	$10,000	0
(V) Lacona	6/28/05	T'storm Wind	50 knots	0	0	$25,000	0
(V) Pulaski	7/13/05	T'storm Wind	50 knots	0	0	$10,000	0
(T) West Monroe	7/26/05	T'storm Wind	50 knots	0	0	$15,000	0
(T) Redfield	8/1/05	T'storm Wind	50 knots	0	0	$10,000	0
(T) Volney	9/29/05	T'storm Wind	50 knots	0	0	$10,000	0
(T/V) Parish	9/29/05	T'storm Wind	50 knots	0	0	$10,000	0
(V) Cleveland	11/6/05	T'storm Wind	50 knots	0	0	$10,000	0
(T/C) Oswego	11/9/05	T'storm Wind	50 knots	0	0	$15,000	0
Widespread	2/17/06	Wind Storm	70 knots	1	0	$3.0M	0
(T) West Monroe	6/19/06	T'storm Wind	50 knots	0	0	$15,000	0
(T/V) Parish	7/3/06	T'storm Wind	50 knots	0	0	$10,000	0
(T) Volney	7/10/06	T'storm Wind	50 knots	0	0	$10,000	0
(V) Phoenix	7/25/06	T'storm Wind	50 knots	0	0	$20,000	0
(V) Phoenix	7/25/06	Hail	0.88"	0	0	$8,000	0
(T) New Haven	7/29/06	T'storm Wind	50 knots	0	0	$10,000	0
(V) Cleveland	8/2/06	T'storm Wind	50 knots	0	0	$5,000	0
(C) Fulton	11/16/06	T'storm Wind	50 knots	0	0	$10,000	0
Widespread	12/1/06	Wind Storm	50 knots	0	0	$25,000	0
(T/C) Oswego	6/8/07	T'storm Wind	50 knots	0	0	$10,000	0
(V) Pulaski	6/19/07	T'storm Wind	50 knots	0	0	$10,000	0
(T/V) Sandy Cr	6/19/07	T'storm Wind	50 knots	0	0	$12,000	0
(T/V) Hannibal	6/19/07	T'storm Wind	50 knots	0	0	$10,000	0
(T/C) Oswego	7/9/07	T'storm Wind	50 knots	0	0	$10,000	0
(T/V) Parish	7/9/07	T'storm Wind	50 knots	0	0	$10,000	0

Table 21 – NOAA NCDC query results: historic severe storm events recorded for Oswego County, January 1950 – August 2009 (NOAA, NCDC, Storm Events Search, 2009)

Location	Date	Event	Magni-tude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
(V) Pulaski	7/11/07	T'storm Wind	50 knots	0	0	$10,000	0
(V) Cleveland	8/25/07	T'storm Wind	52 knots	0	0	$15,000	0
(T) Volney	9/11/07	T'storm Wind	50 knots	0	0	$15,000	0
(T/V) Hannibal	1/9/08	T'storm Wind	50 knots	0	0	$10,000	0
(C) Fulton	1/9/08	T'storm Wind	50 knots	0	0	$8,000	0
(T) Scriba	1/9/08	T'storm Wind	50 knots	0	0	$8,000	0
(T) Constantia	1/9/08	T'storm Wind	65 knots	0	0	$15,000	0
(C) Fulton	6/6/08	T'storm Wind	50 knots	0	0	$10,000	0
(V) Central Sq	6/6/08	T'storm Wind	50 knots	0	0	$12,000	0
(C) Fulton	6/10/08	T'storm Wind	50 knots	0	0	$15,000	0
(T/C) Oswego	6/10/08	T'storm Wind	50 knots	0	0	$45,000	0
(V) Pulaski	6/10/08	T'storm Wind	50 knots	0	0	$75,000	0
(T/V) Sandy Cr	6/10/08	T'storm Wind	58 knots	0	0	$35,000	0
(V) Altmar	6/29/08	T'storm Wind	50 knots	0	0	$100,000	0
(V) Phoenix	7/23/08	T'storm Wind	50 knots	0	0	$15,000	0
(T) Scriba	7/24/08	Hail	1.00"	0	0	$20,000	$5,000
(T) Minetto	8/10/08	Hail	0.75"	0	0	$5,000	0
(T/C) Oswego	8/10/08	Hail	1.00"	0	0	$10,000	0
(T) Scriba	8/10/08	Hail	1.25"	0	0	$10,000	$10,000
(T) Scriba	8/10/08	Hail	1.25"	0	0	$10,000	$10,000
(C) Fulton	9/14/08	T'storm Wind	52 knots	0	0	$15,000	0
Widespread	9/15/08	Wind Storm	66 knots	0	0	$250,000	0
Widespread	12/24/08	Wind Storm	61 knots	0	0	$25,000	0
(T) Richland	4/21/09	Hail	0.75"	0	0	$5,000	$15,000
(T) Granby	5/16/09	T'storm Wind	50 knots	0	0	$5,000	0
(T) Palermo	5/16/09	T'storm Wind	50 knots	0	0	$25,000	0
(T) Palermo	5/16/09	T'storm Wind	50 knots	0	0	$8,000	0
(T/V) Parish	5/16/09	T'storm Wind	50 knots	0	0	$10,000	0
(T) Williamstown	5/16/09	T'storm Wind	50 knots	0	0	$10,000	0
(T) Schroeppel	7/7/09	Hail	0.75"	0	0	0	$12,000
(T) Williamstown	7/7/09	Hail	0.75"	0	0	0	$12,000
(T) Palermo	7/26/09	T'storm Wind	50 knots	0	0	$8,000	0
Totals:	**--**	**--**	**--**	**2**	**3**	**$4.7M**	**$64,000**

6.1.4 County Vulnerability and Probability of Future Events

Severe storms occur within Oswego County at least a half dozen times a year, categorizing the likelihood of a future severe storm event as highly probable. A severe storm event could also cause fires, flooding, landslides, utility failure, structural collapse, and transportation accidents. Flooding effects could also cause a dam failure. In a worst-case scenario, a severe storm could cause widespread power outages in much of the County, requiring the opening of the County Emergency Operations Center to coordinate resources and manage human needs. High winds could cause moderate damage to private property and public facilities.

Property damage and loss of life from severe storms are increasing due to a variety of factors. Use of manufactured housing is on an upward trend, and this type of structure provides less resistance to wind than conventional construction. Property damage is also more probable due to the deteriorating condition of older homes, and the increased use of aluminum-clad mobile homes (FEMA, 1997).

Severe storm was analyzed as a frequent event as a result of the HIRA-NY analysis completed by the County. Severe storms are fairly common in Oswego County, as indicated by the historical evidence above. The County is fairly well equipped and trained to respond to severe storm events; however, equipment updates and multi-jurisdictional coordination efforts and agreements may help to alleviate some of the pressure on post-disaster maintenance and clean-up forces. Figures 6.4 and 6.5 illustrate the probabilities for thunderstorm winds and severe hail to occur within the United States. As shown, the probability for severe winds in Oswego County is 3-4 days per year (turquoise and purple color bands). The probability of severe hail events to occur in Oswego County is shown as zero days per year.

Figure 6.4 – Probability for thunderstorm winds (greater than 50 knots) to occur in the United States, reported in days per year (NOAA, NSSL, 2003)

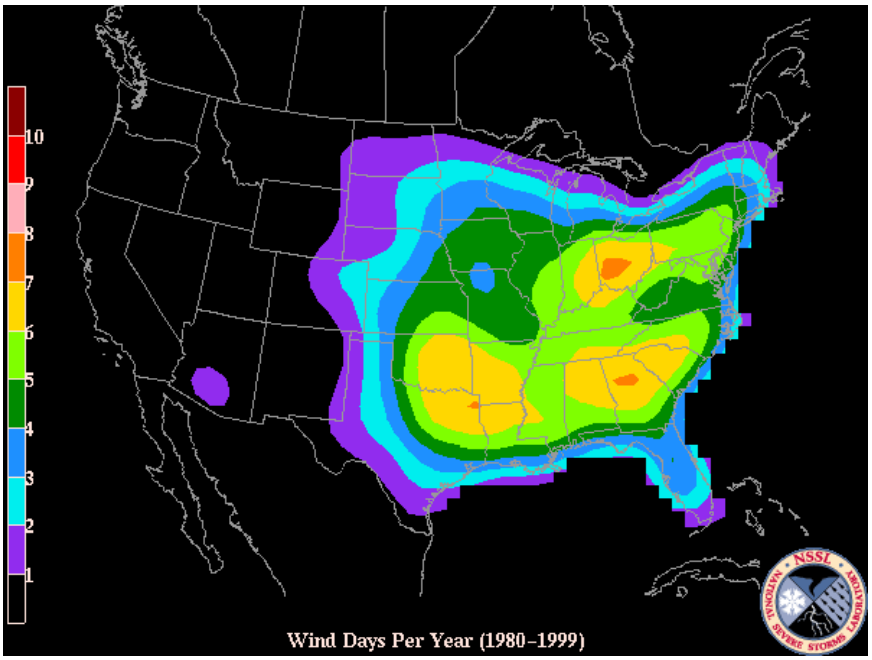
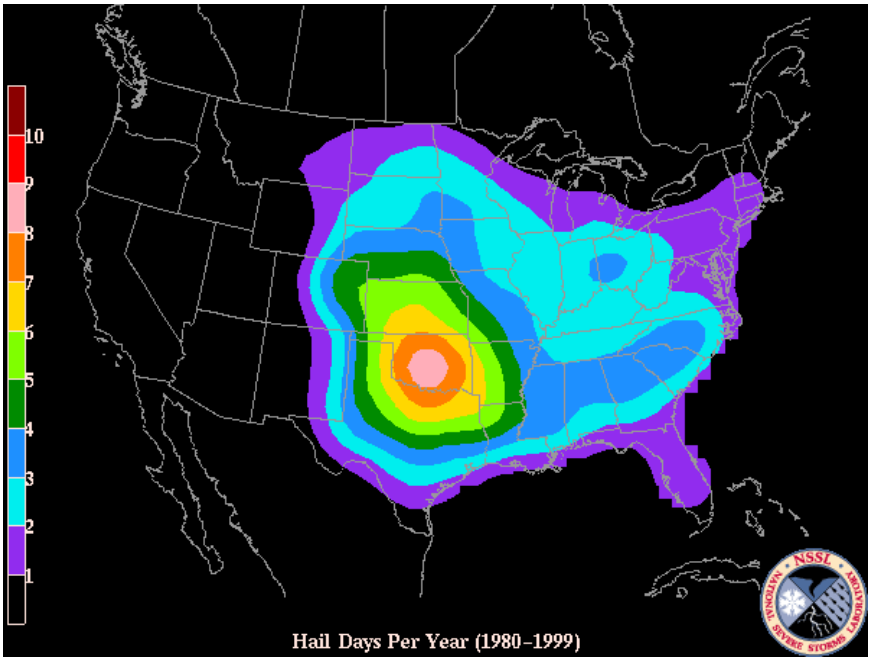


Figure 6.5 – Probability for severe hail (3/4-inch diameter or greater) to occur in the United States, reported in days per year (NOAA, NSSL, 2003)



6.1.5 Damage Estimate

A presidential declaration has never been issued for damage from a severe storm in Oswego County. No FEMA reimbursement funds have been distributed for such an event to a jurisdiction within Oswego County. Upon reviewing the loss estimates provided by the NCDC, $4.7 million dollars of private property and crops have been damaged in Oswego County since 1975, not including widespread storm events where a damage amount specific to Oswego County couldn't be obtained. This damage estimate calculates out to approximately $138,000 in damage each year from severe storm events. Much of this damage is associated with utility failure, fallen trees, and structural damage to residential dwellings. This yearly damage amount represents less than 1-percent of the total value of properties located within Oswego County, but it could represent up to 3-percent of the total value of some jurisdictions within the County. Detailed records of severe storm damage within Oswego County were not kept until around 1992/1993. If detailed records had been available from 1975-1992, the total damages from severe storms within the County would likely be substantially higher. The extent of damage that could be caused by a severe storm is directly related to the specific area(s) of impact.

6.2 Ice Storm Hazard Profile

6.2.1 Hazard Description

The Oswego County risk assessment group decided that ¼" of ice would be the local threshold to constitute an ice storm. This threshold was recommended by the National Weather Service, at the May 29, 2009 risk analysis session. Ice storms are characterized by freezing rain which accumulates in a substantial glaze layer of ice resulting in serious disruptions of normal transportation and possible downed power lines.

The NWS uses the term 'ice storm' to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in the loss of power and communications. Such accumulations of ice pose a risk to walking and driving. Damage from such events could include structural damage, utility failures, and tree damage as a result of excessive weight.

Only one record within the NOAA NCDC database specifically indicated damage to Oswego County as part of an ice storm event. This record is included in Table 22.

Table 22 – NOAA NCDC query results: historic ice storm events recorded for Oswego County, January 1950 – August 2009 (NOAA, NCDC, Storm Events Search, 2009)

Location	Date	Event	Magni-tude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
Widespread	4/4/03	Ice Storm	9-12" mix	1	0	$28.6M	$8.6M
Totals:	**--**	**--**	**--**	**1**	**0**	**$28.6M**	**$8.6M**

6.2.2 Geographic Location

This hazard could occur anywhere within Oswego County and could affect a small area or a widespread part of the County.

6.2.3 Historic Occurrences

The only notable ice storm that has occurred in recent history is the Oswego County Ice Storm of April 2003. This event started on April 3, 2003, and lasted for at least two days. Up to an inch of ice accumulation was measured as a result of this storm. Oswego County was included in a Federal Disaster Declaration for this hazard event; both Public Assistance and Individual Assistance was awarded. The heavy ice accumulation downed trees and power and telephone lines, resulting in

power outages that lasted up to a week in some areas. Over 175,000 customers lost power during this event. Fruit trees in multiple counties were also severely damaged by this event. Several shelters were opened to house people that lost their utilities.

A severe ice storm event also occurred in Jefferson County, New York during the winter of 1998. Though minimal damage occurred in Oswego County as a result of this event, the storm did occur nearby and helps to illustrate the potential for severe ice storms within Oswego County.

6.2.4 County Vulnerability and Probability of Future Events

Ice storms occur within Oswego County and nearby areas between once a year and once every seven years, categorizing the likelihood of a future ice storm as a regular event. An ice storm event could cause a variety of cascading effects including explosion, fire, food shortage, fuel shortage, structural collapse, transportation accidents, utility failure, and water supply contamination. An ice storm event with cascading effects could cause human-needs issues for the County, such as shelter, food, transportation, etc. Fallen trees and power lines could cause structural failures for homes, businesses, and public buildings.

Ice storm was ranked as a moderately high hazard as a result of the HIRA-NY analysis completed by the County. The group discussed that while Oswego County has had only one federally declared disaster due to an ice storm, the potential of another one occurring within the County appears to be higher. Minor ice storm events frequently occur within the County. Oftentimes, sleet and freezing rain are included as a winter storm event and are not specifically classified as an ice storm. The County is only moderately equipped to deal with ice storms, especially severe events. Important mitigation items such as updating the

emergency shelter options within the County would help to coordinate a County action plan in case of such a hazard event.

6.2.5 Damage Estimate

The sole Presidential Declaration issued for an ice storm event that affected Oswego County resulted in FEMA issuing a total of $1,539,660 in Public Assistance funds to Oswego County, its municipalities, and public agencies. This funding amount does not represent the potential severity that could occur in association with an ice storm event. The extent of damage that could be caused by an ice storm is directly related to how widespread of an area is affected. A severe ice storm has the potential to damage 10 percent of the critical infrastructure within Oswego County, resulting in the need to open emergency shelters and make emergency utility repairs. The 2003 ice storm resulted in $28.6 million in property damage and $8.6 million in crop damage.

6.3 Earthquake Hazard Profile

6.3.1 Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of Earth's tectonic plates. The severity of these tremors is dependent upon the amount of energy released from the fault or epicenter (Oswego County Hazard Analysis, 2009). The effects of an earthquake can be felt at distances beyond its actual occurrence, though the effects are less severe as the distance increases. Earthquakes often occur without warning and can quickly cause extensive damage and extensive casualties. Common effects of earthquakes include ground motion and shaking, surface fault ruptures, and ground failure (HIRA-NY, Definitions of Hazards).

Ground Motion

Ground motion is the vibration or shaking of the ground during an earthquake event. When a fault ruptures, seismic waves radiate, causing the ground to vibrate or shake. Soft soils can amplify the ground motions.

Surface Fault Ruptures

Surface faulting is the differential movement of two sides of a fracture. Surface faults are characterized by their length, width, and displacement of the ground.

Ground Failure

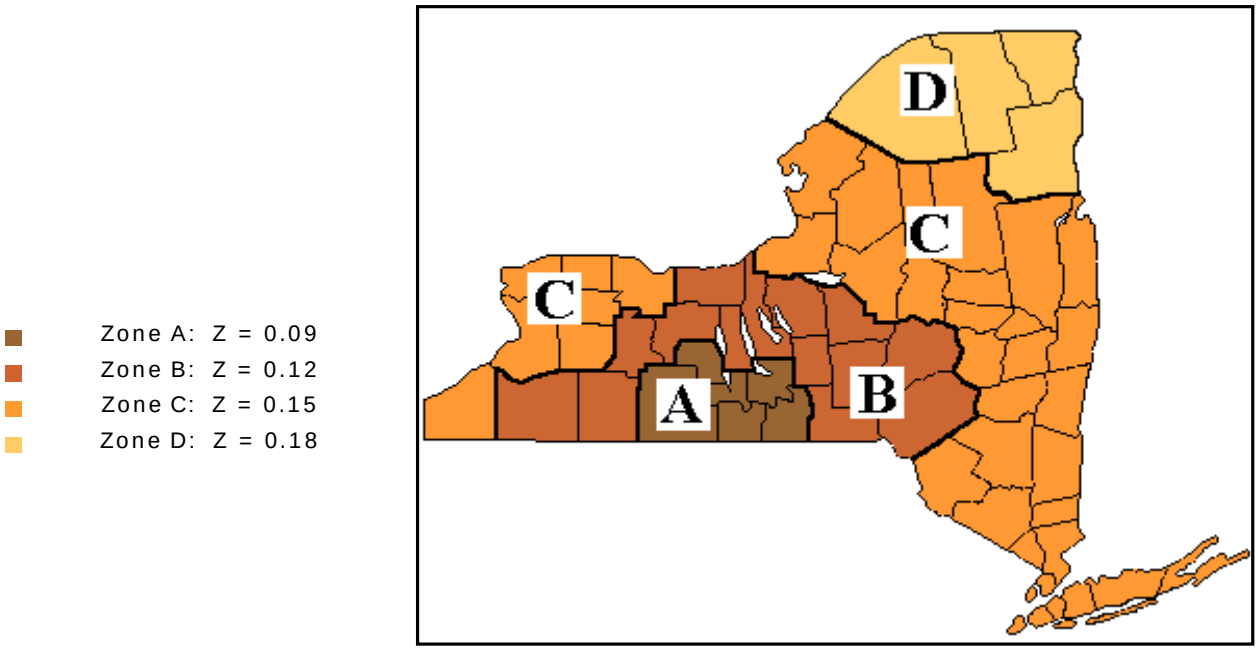
Sometimes the shaking of the ground causes loose soils to lose strength and act like viscous liquid, an occurrence called liquefaction. This incident can cause two types of ground failure, lateral spread and loss of bearing strength. Lateral spread failures develop on gentle slopes and involve the sidelong movement of large masses of soil as an underlying layer becomes liquefied. Loss of bearing strength failures result when the soil supporting structures liquefies, causing the structures to tilt and collapse.

6.3.2 Geographic Location

An earthquake could take place anywhere in Oswego County. There is also the potential to feel the effects of an earthquake that occurred outside the County. Depending on the potential earthquake risk within New York State, the State was split into 4 seismic zones. Each zone is assigned a Peak Ground Acceleration (PGA) Value which is used to determine the earthquake risk for each County in the State. The PGA Value measures the horizontal force of an earthquake in terms of

percentage of gravity. The PGA Values of New York State, as determined by the NYS Earthquake Code Advisory Committee, range from 0.09g (% of gravity) to 0.18g. The higher the value, the greater the earthquake risk in that area. Figure 6.4 shows the locations of mapped seismic zones throughout New York State.

Figure 6.6 – Locations of earthquake Seismic Zones A-D are shown within New York State (MCEER, 2009)



As shown in Figure 6.6, Oswego County is located within Seismic Zone C, which has a PGA Value of 0.15g, or 15% of gravity. This represents a worst-case event for Oswego County and has a 10% probability of occurring over a 50-year period or a 100% probability of occurring over a 500 year timeframe. The PGA values associated with this figure are for average soil conditions. Depending on the actual soil type at a location, the PGA value would either increase or decrease. The actual soil type can substantially increase the earthquake risk for a particular area. Table 23 indicates the calculation factors to determine location specific PGA Values based on mapped soil types.

Table 23 – Peak Ground Acceleration Value conversion factors based on soil type(s) within a specific area or locality (HIRA-NY, Definitions of Hazards)	
Soil Type	Multiply "g" value by:
Very hard rock (granite, gneiss, etc.)	0.8
Rock (sedimentary) or firm ground	1.0
Stiff clay	1.2
Soft to medium clays or sands	1.5
Soft soil (incl. fill, loose sand, waterfront, lake bed clays)	2.0

Three general regions within New York State have a higher seismic risk than the rest of the State. These regions include:

- The north/northeast section of the State, including the North Country/Adirondack Region and a portion of the Greater Albany/Saratoga Region;
- The southeast corner of the State, including the Greater New York City area and western Long Island; and
- The northwest corner of the State, including the City of Buffalo and the general area.

As indicated by Figure 6.7, the very northeast corner of Oswego County is included in the north/northeast section detailed above, and is assigned a PGA Value of 4. The remainder of Oswego County is displayed as having a PGA Value of 3 (less earthquake risk).

Figure 6.7 – Peak Ground Acceleration Values for New York State and surrounding areas (USGS, Earthquake Hazard Program, 2009)

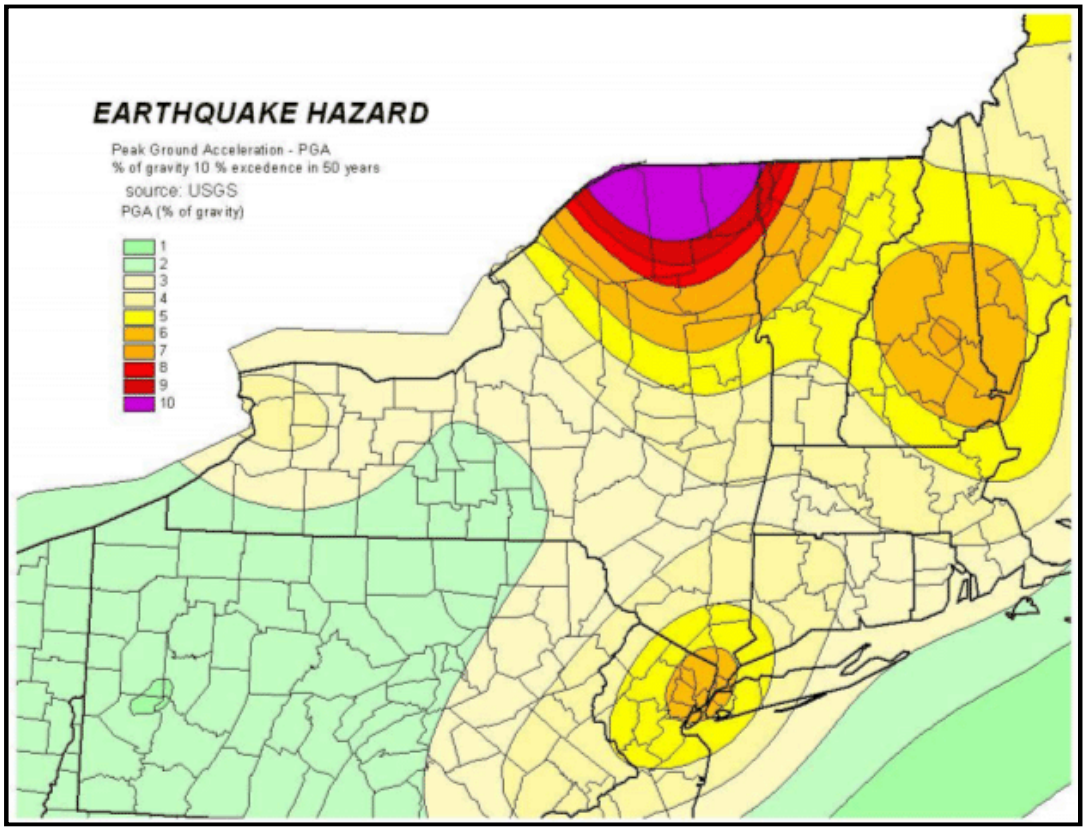
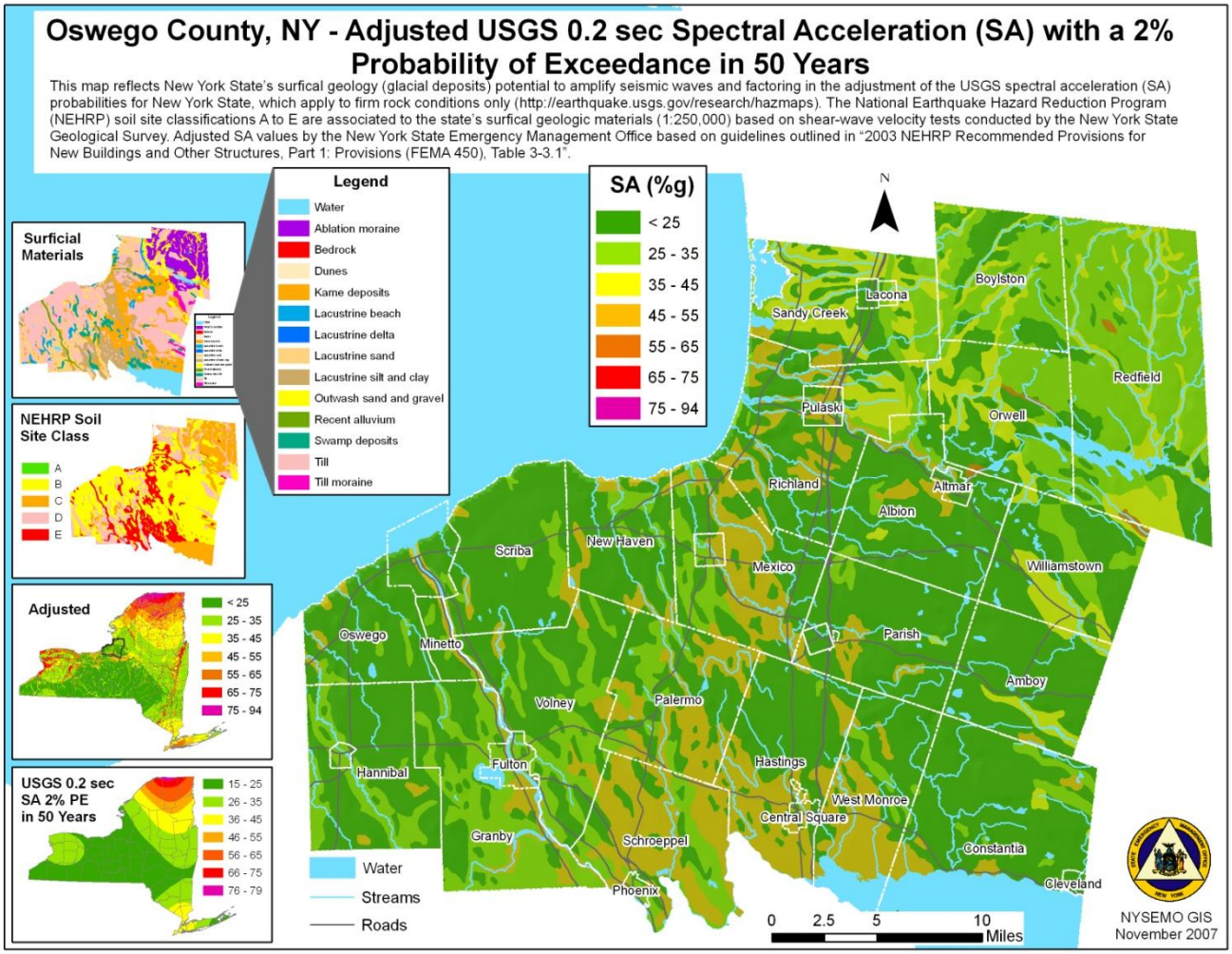


Figure 6.8 shows the potential of the surficial geology within Oswego County to amplify seismic waves. Adjusted spectral acceleration (SA) probabilities were determined by the USGS and are shown in this figure.

Figure 6.8 – Adjusted Spectral Acceleration Probabilities for Oswego County
(NYSEMO GIS, 2007)



6.3.3 Historic Occurrence

Oswego County is located adjacent to an inactive fault line; however, no records detailing earthquake events within the County were found. Despite the absence of earthquakes generated within the County, multiple events of ground shaking from earthquakes has occurred as a result of earthquakes in other part of New York State. Figures 6.9 and 6.10 illustrate the seismicity, defined as the frequency or magnitude of earthquake activity in a given area, of earthquakes within New York and the surrounding region.

Figure 6.9 – Frequency of earthquake activity within New York State and surrounding areas, 1990-2006 (USGS, Earthquake Hazard Program, 2009)

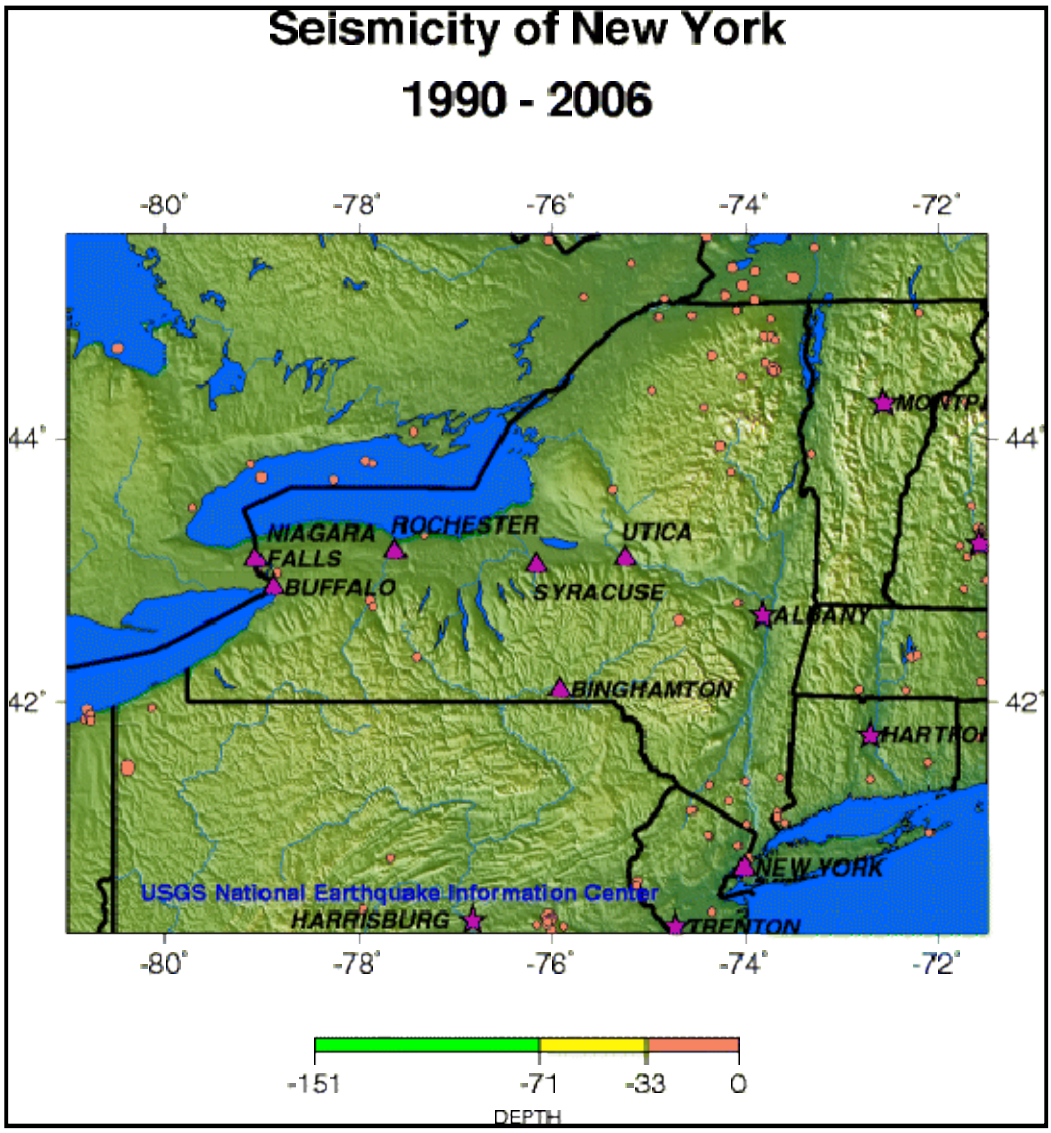
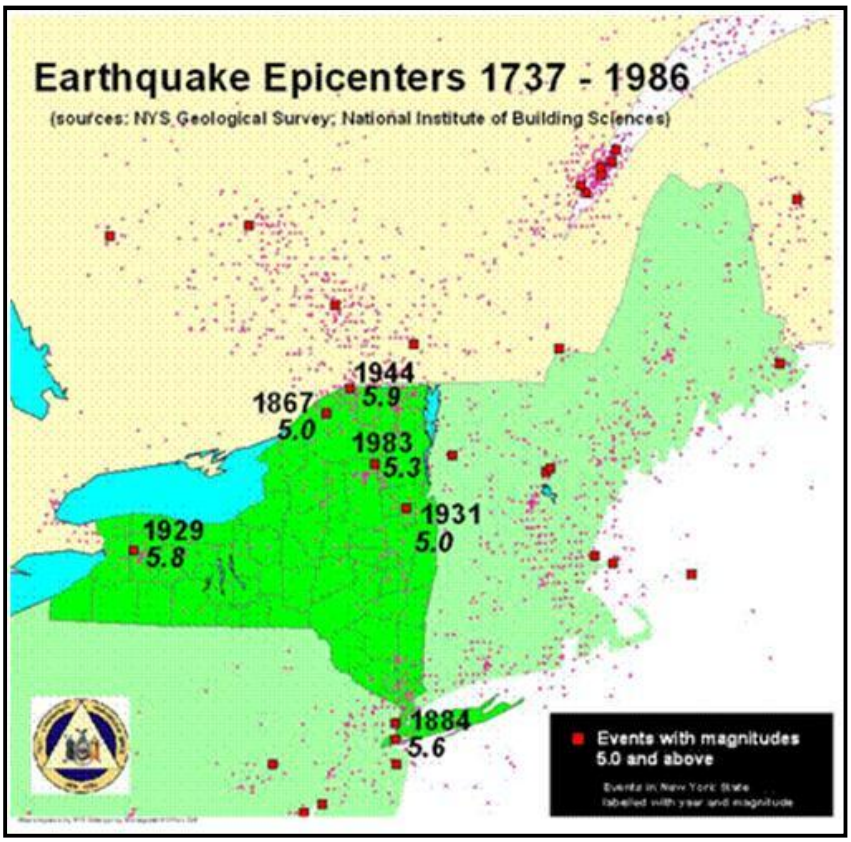


Figure 6.10 – Locations of historic earthquake activity within the Northeast United States, 1737-1986 (2011 NYS Hazard Mitigation Plan)



As shown in Figures 6.9 and 6.10 many earthquakes, though predominantly minor, occur in other parts of New York State. Effects from these events have occurred in Oswego County. Earthquake events are measured by magnitude using the Richter Scale and intensity using the Mercalli Scale. Table 24 details these rating scales so that they may be referenced when reviewing historic records of earthquakes that have affected the County, included as Table 25.

Table 24 – Richter Magnitude Scale and Mercalli Intensity Scale Ratings
(USGS, Earthquake Hazards Program, 2009)

Richter Magnitude Scale	Mercalli Intensity Scale	Intensity Scale Details
1.0 – 3.0	I	Not felt except by a few persons at rest under favorable conditions
3.0 – 3.9	II – III	Felt only by some at rest – felt noticeably indoors, especially on upper floors
4.0 – 4.9	IV – V	Felt by many indoors, some/many outdoors, minor damage occurs
5.0 – 5.9	VI – VII	Felt by all, damage to inadequate structures, many frightened
6.0 – 6.9	VIII – IX	Considerable damage to many types of structures, structural collapse
7.0 and higher	X or higher	Structures destroyed, bridges and rails bent, object thrown, line of sight & level distorted

Table 25 – Historic earthquakes that have effected or been felt in Oswego County since mid-1600's (USGS, Historic U.S. Earthquakes, 2009)

Epicenter Location	Date of Event	Magnitude	Intensity	Details
New York City	12/18/1737	Unk	VII	Shock was reportedly felt at Boston and Philadelphia-assumed to have also been felt in Oswego County
Buffalo, NY	10/23/1857	Unk	VI	Total area that felt event covered 46,000 sq km, which would include Oswego County
NE NYS	11/4/1877	Unk	VII	Total area that felt event covered 233,000 sq km, which would include Oswego County
New York City	8/10/1884	5.5	VII	Total area that felt event covered 181,000 sq km, which would include Oswego County
NE NYS	5/27/1897	Unk	VI	Felt over a greater portion of NYS, assumed to include Oswego County
Quebec, Canada	2/28/1925	7.0	VIII	Total area that felt event covered 4,200,000 sq km, which would include Oswego County
Attica, NY	8/12/1929	Unk	VIII	Total area that felt event covered 250,000 sq km, which would include Oswego County
Lake George, NY	4/20/1931	Unk	VII	Total area that felt event covered 155,000 sq km, which would include Oswego County
Quebec, Canada	11/1/1935	6.3	Unk	Event felt throughout most of New York State, assumed to include Oswego County
Near Massena, NY	9/5/1944	5.8	VIII	Event felt throughout northern half of NYS, assumed to include Oswego County
Attica, NY	1/1/1966	4.7	VI	Total area that felt event covered 46,500 sq km, which would include Oswego County
Blue Mt Lake, NY	10/7/1983	5.3	VI	Event felt throughout NYS and Northeast US, known to include Oswego County
Au Sable Forks	4/20/2002	5.1	VII	Felt in Oswego County, structural damage to Amboy Fire Station

Though not yet included in the USGS Historic Earthquake database, a recent earthquake occurred in southern Canada on June 23,

2010. This 5.0 magnitude earthquake, which occurred 35 miles north-northeast of Ottawa, was felt in Oswego County. No damage was reported as a result of this event.

6.3.4 County Vulnerability and Probability of Future Events

Though inactive fault lines are located within Oswego County, no reported earthquakes have occurred over the past 3+ centuries. Given the extent of nearby active fault lines, the potential for Oswego County to be affected by earthquakes outside the County boundaries is highly probable, though classified as an infrequent event. Within Oswego County, earthquakes are ranked as a moderately high hazard that could result in moderate damage to private property and public infrastructure. It is estimated that the hazard duration for an earthquake event would last less than one day and that the recovery time for the County from such an event would be reasonably short (1-2 weeks).

The County is ill-prepared to recover from a severe earthquake event; however, this would be a rare event and adequately preparing for such a hazard would not be beneficial at this time. Minor damage and impacts from other earthquake events within New York and Quebec, Canada are likely to continue to occur on an infrequent basis.

6.3.5 Damage Estimate

FEMA's HAZUS software includes a method to quantify and compare general earthquake risk of different Counties within New York State using an annual loss estimation method. This methodology considers the regional variation in earthquake hazard with the characteristics of the built environment within a specific County. The earthquake loss estimation tool included in the software includes a total exposure number which represents the dollar value of all existing

infrastructure within the County and a potential total loss calculation for 4 return periods: 2500, 1000, 500, and 250 years. Table 26 shows the results of the HAZUS earthquake tool for Oswego County.

Table 26 – HAZUS Software Earthquake Risk Tool – Oswego County
(FEMA, HAZUS-MH Software, 2009)

County	Total Exposure	Total Losses (* $1,000)			
		2500-Year	1000-Year	500-Year	250-Year
Oswego	6,721,236	$169,866	$51,029	$18,816	$6,067

Potential cascading hazards that could occur from a strong earthquake include dam failure, explosion, fire, fuel shortage, hazmat at a fixed site, hazmat in transit, oil spill, radiological at a fixed site, structural collapse, transportation accident, utility failure, and water supply contamination. Historical evidence shows that Oswego County rarely has to deal with damaging earthquake events, resulting in a low damage estimate for this hazard. The cost to repair the Amboy Fire Station is not available, but this was the only evidence of permanent damage within Oswego County during the previous 3+ centuries of earthquake records that were reviewed for this plan. A minor earthquake event would likely result in no damage to existing infrastructure, while a more moderate occurrence may result in 1-3% damage/loss estimates for existing buildings and property.

Arguably the most important resources to keep from sustaining damage are the nuclear facilities located in the Town of Scriba. These facilities are seismically qualified, meaning that they have demonstrated acceptable performance during a moderate earthquake event through testing and facilitated events. This qualification does not mean that damage could not result if the event was severe enough, but at a moderate and small scale, the safety of the nuclear facilities should not be jeopardized. Special details are included in the safety analysis report for the nuclear sites in regards to seismic activity.

An instrumental mitigation action that could be implemented in order to reduce the amount of property damage that may result from an earthquake event is to educate the public on how to prepare for such an occurrence. Educating the public on what improvements they can make to help protect their residences and businesses from sustaining damage will help to minimize the potential for property damage.

6.4 Tornado Hazard Profile

6.4.1 Hazard Description

Tornadoes are described as local atmospheric storms, generally of short duration, formed by winds rotating at very high speeds, usually in a counter-clockwise direction. The vortex of the tornado can be up to several hundred yards wide and is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity or funnel. Tornado winds have been estimated to be as high as 400 miles per hour (HIRA-NY, Definitions of Hazards).

The National Weather Service describes tornadoes as violently rotating columns of air that come in contact with the ground and extend from the base of a cumuliform cloud. A condensation funnel does not need to reach to the ground for a tornado to be present; a debris cloud underneath a thunderstorm is all that is needed to confirm the presence of a tornado, even in the absence of a condensation funnel. Tornadoes always start as funnel clouds and may be accompanied by a loud roaring noise.

The most destructive and deadly tornados occur from supercells, which area described as rotating thunderstorms with a well-defined radar circulation called a mesocyclone. Supercells are also capable of producing damaging hail, severe winds, frequent lightning, and flash

flooding. Tornado formation is believed to be dictated mainly by things which happen on the storm scale, in and around the mesocyclone (Edwards, NOAA Storm Prediction Center, 2009).

Waterspout

A waterspout is a tornado over water. Waterspouts can happen over seas, bays, and lakes, most common in the U.S. along the southeast coast. Although waterspouts are always tornadoes by definition, they do not officially count in tornado records unless they hit land. Waterspouts can overturn boats, damage larger ships, cause significant damage when they hit land, and can cause casualties, much like a regular land-based tornado. The NWS often issues special marine warnings when waterspouts are likely or have been sighted over coastal waters.

Multi-Vortex Tornado

A multi-vortex tornado contains two or more small, intense subvortices orbiting the center of the larger tornado. When a tornado does not contain too much dust and debris, the multiple vortices may be visible. These vortices may form and die within a few seconds and can happen in all sorts of tornado sizes. Subvortices are the cause of most of the narrow, short, extreme swaths of damage that sometimes arc through larger tornado paths.

6.4.2 Geographic Location

Tornadoes have occurred multiple times over several locations within Oswego County between 1950 and 2009, and have the ability to occur anywhere within the County. Tornadoes are nature's most violent storms, with the potential to cause fatalities and devastation to a neighborhood in a matter of seconds. Damage paths from tornadoes can

be in excess of one mile wide and 50 miles long. The average tornado moves southwest to northeast, but they have been documented to move in any direction. East of the Rocky Mountains, tornadoes are most commonly reported during the spring and summer months.

6.4.3 Historic Occurrence

The magnitudes of tornadoes are measured using the Enhanced Fujita Tornado Damage Scale or Enhanced F-scale. This scale took effect on February 1, 2007, after three decades of using the original F-scale developed in the early 1970's. The Enhanced F-scale is a much more precise way to assess tornado damage. In the Enhanced F-scale there are customized standards for assigning any given F rating to different types of constructed structures and the damage that they incur during a tornado. This enhanced scale rates the tornado as a whole based on the most intense damage within its path (Edwards, NOAA Storm Prediction Center, 2009). Table 27 illustrates the Enhanced F-scale rating system. This system uses a set of wind estimates, not measurements, based on damage. It uses 3-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to the 27 indicators listed below. These estimates vary with height and exposure (NOAA, Storm Prediction Center, Enhanced F-scale).

Table 27 – Enhanced F-scale system used to rate magnitude of tornado events
(NOAA, Storm Prediction Center, Enhanced F-Scale)

Fujita Scale			Derived EF Scale		Operational EF Scale	
F Number	**Fastest ¼-mile (mph)**	**3 Second Gust (mph)**	**EF Number**	**3 Second Gust (mph)**	**EF Number**	**3 Second Gust (mph)**
0	40-72	45-78	0	65-85	**0**	**65-85**
1	73-112	79-117	1	86-109	**1**	**86-110**
2	113-157	118-161	2	110-137	**2**	**111-135**
3	158-207	162-209	3	138-167	**3**	**136-165**
4	208-260	210-261	4	168-199	**4**	**166-200**
5	261-318	262-317	5	200-234	**5**	**Over 200**

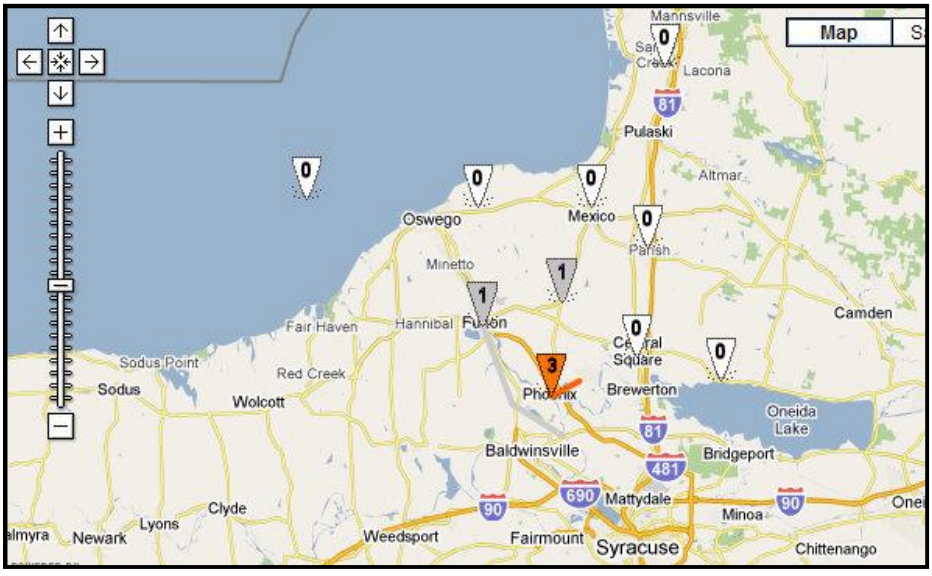
The National Climatic Data Center (NCDC) reports eight tornadoes that have occurred within Oswego County between 1950 and 2009 and one report of a waterspout within the same time period. Table 28 details the specifics and damages for each of these events.

Table 28 – NOAA NCDC query results: historic tornado and waterspout events recorded for Oswego County, January 1950 – August 2009 (NOAA, NCDC, Storm Events Search, 2009)

Location	Date	Event	Mag-nitude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
Oswego County	9/9/1960	Tornado	F1	0	0	0	0
Oswego County	5/30/1972	Tornado	F0	0	0	$25,000	0
Oswego County	9/8/1981	Tornado	F1	0	0	$3,000	0
Oswego County	5/2/1983	Tornado	F3	0	0	$250,000	0
Oswego County	7/13/1986	Tornado	F1	0	0	$250,000	0
(T/V) Mexico	8/2/1993	Tornado	F0	0	0	$50,000	0
(V) Central Square	5/26/1994	Tornado	F0	0	0	$50,000	0
(T) Granby	7/15/1996	Tornado	F0	0	3	$35,000	0
Totals:	--	--	--	**0**	**3**	**$663,000**	**$0**

The historic locations of tornados that have affected Oswego County are shown on Figure 6.11. The eight (8) tornados that are detailed in Table 28 are included on this figure.

Figure 6.11 – Shows the beginning locations of historic tornados that have occurred within Oswego County, 1950-2008 (Lietz, Tornado History Project, 2005-2010)



The Tornado History Project data illustrated in Figure 6.11 details two additional historic tornado events that were not reported by the National Climatic Data Center. Table 29 details the specifics of these two additional hazard events.

Table 29 –Historic tornado events recorded by the Tornado History Project for Oswego County, 1950 – 2008, that were not reported by the NCDC in Table 24
(Lietz, Tornado History Project, 2005-2010)

Location	Date	Event	Magni-tude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
(T) Constantia	6/15/1993	Tornado	F0	0	0	$5,000 - $50,000	N/A
(V) Parish	8/31/1995	Tornado	F0	0	1	$5,000 - $50,000	N/A
Totals:	**--**	**--**	**--**	**0**	**1**	**Unk**	**N/A**

The July 15, 1996 tornado event, recorded in the Town of Granby, destroyed a mobile home which injured three people inside the structure at the time. These are the only injuries reported for any of the historic tornado occurrences within Oswego County.

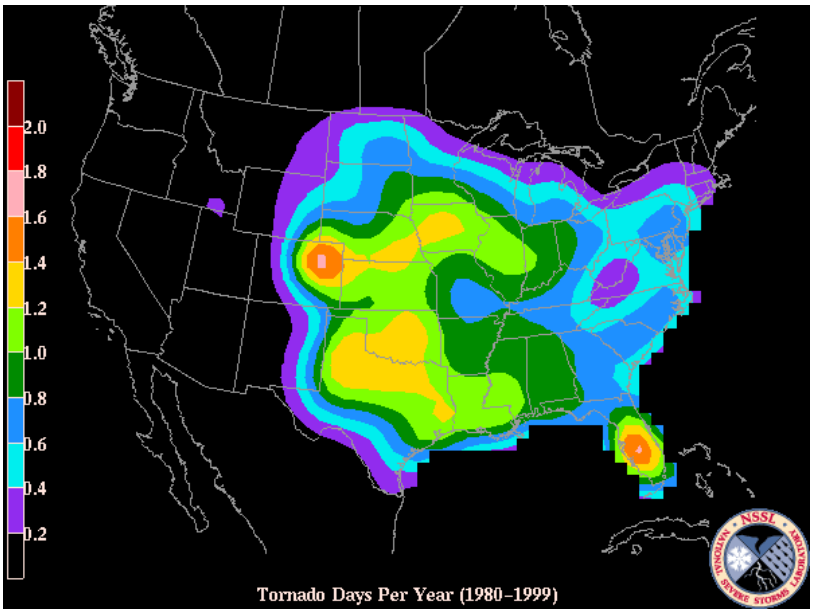
The most recent tornado event occurred on June 28, 2010, when an EFO tornado touched down in the Town of Palermo. Preliminary wind estimates were 70 to 80 miles per hour. The tornado caused minor tree damage when it first touched down and uprooted large trees and blew the roof off a barn as it moved further east. No other damages were reported.

6.4.4 County Vulnerability and Probability of Future Events

The severity of a tornado event within Oswego County would be moderately low, with death or injury likely, but not in large numbers. This conclusion is based on the frequency and magnitude of tornadoes reported within the County in the past 60 years. The likelihood of a tornado occurring as part of a severe thunderstorm is seen as a regular

event, as events have occurred about every other year. Damage from such events has been little to none on a County-wide basis. Figure 6.12 shows the probability for a tornado of any magnitude to occur in "days per year." Oswego County is mapped in the purple color band which indicates a tornado probability (any size) of 0.2-1.2 days per year.

Figure 6.12 – Probability for a tornado (any size) to occur in the United States, reported in days per year (NOAA, NSSL, 2003)



6.4.5 Damage Estimate

Cascade effects are highly likely for a tornado. Possible cascading effects include fire, structural collapse, transportation accident, and utility failure. While tornadoes have been a fairly regular event in Oswego County, the damage resulting from these events has not been widespread. Because of these factors, tornadoes were recognized as being a moderately low hazard within Oswego County. Despite this low hazard designation, 20 jurisdictions included tornado as one of the hazards that they assessed for risks in their single and multi jurisdictional hazard reviews.

The damage losses associated with the NCDC's reported historic tornado events within the County reflect a low-level of damage with all losses since 1950 totaling under $700,000 dollars. The Tornado History Project's tornado records were not used to estimate potential losses since exact damage amounts were not provided. About half of the total damage amount was a result of the damage caused by the recorded waterspout in 1993. The median average for damage losses over the NCDC's 9 historic tornado events is $50,000. Though no areas of the State are safe and tornados could occur in any County, this hazard does not appear to be a severe hazard with a high probability within Oswego County.

Except from tornadoes that occur without warning, programs like the NY-Alert system and the National Weather Service would likely issue tornado warnings for the County if such an event were deemed possible. Early warnings would allow residents to watch the weather and seek shelter, if appropriate. It would also be beneficial to educate the public on the steps to follow if a tornado were to occur and the procedures that the County and Municipalities would initiate in the event of such a hazard. In this case, greater public education and awareness would help to save lives and minimize injuries.

6.5 Flood Hazard Profile

6.5.1 Hazard Description

Floods are natural events for rivers and streams where excess water from snowmelt, rainfall, or storm surges accumulates and overflows onto the banks and adjacent floodplains of these waterbodies. Floodplains are lowland areas located adjacent to waterbodies that are subjected to recurring flood events.

Several factors determine the severity of floods, including intensity and duration of rainfall or other water sources. A large amount of rainfall over a short period can result in flash flood conditions. Even a small amount of precipitation can result in flood events in locations where the soil is already saturated or in areas with large amounts of impervious surfaces (i.e., large parking lots, roadways, developments, etc.). Topographic and cover type characteristics are also factors that contribute to the severity of flood events. Water runoff is greater in areas with steep slopes and little or no vegetative ground cover. Frequency of inundation depends on the climate, soil, and channel slope of a particular area.

In regions where substantial precipitation occurs during a particular season each year, or in regions where annual flooding occurs mainly from snowmelt, the floodplains may be inundated almost every year. In regions without extended periods of below-freezing temperatures, floods usually occur in the season of highest precipitation. In areas where flooding is primarily caused by melting snow, the flood season is spring or summer (HIRA-NY, Descriptions of Hazards).

Flash Flooding

Flash floods can develop very quickly, often in just a few minutes and without any visible signs of rain. Flash floods are known to have a high velocity of water that carries rocks, mud, and other debris with it and can sweep away most items in its path (FEMA, Flood, 2009). Flash flood damage tends to occur in areas immediately adjacent to a stream or arroyo, due to a combination of heavy rain, dam failure, levee failure, rapid snowmelt, and ice jams. Additionally, heavy rain falling on steep terrain can weaken soil and cause debris flow, damaging homes, roads, and property.

Mountains and steep hills produce rapid runoff and quick stream response. Rocks and clay soils do not allow much water to infiltrate the ground. Steep narrow valleys generate rapid flowing waters that can rise quickly to a considerable depth. Saturated soil also can lead rapidly to flash flooding. Other high risk areas include canyons, low water crossings, recent burn areas in mountains, and urban areas from pavement and roofs which concentrate rainfall runoff (NOAA, NWS, 2005).

Flash Flood events can be caused by, or be heavily influenced by, other hazard events such as coastal storms and severe storms.

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA), which is the government entity that administers the National Flood Insurance Program (NFIP), has mapped the known floodplains within much of the United States. When a flood study is completed for the NFIP, the information and maps are assembled into a Flood Insurance Study (FIS). A FIS compiles flood risk data for specific waters or hazard areas within specific communities and includes the main causes of flooding in these areas. The FIS reports delineate Special Flood Hazard Areas (SFHAs), designate flood risk zones, and establish base flood elevations (BFEs) within certain areas. BFEs are based on the flood event that has a 1-percent (1%) chance of occurring annually, or the 100-year flood (HIRA-NY, Definitions of Hazards).

100-year Floodplain

The 100-year floodplain designates an area that has, on average, a 1-percent chance of flooding in any given year. It is important to note that a 100-year flood could occur during subsequent years or once every 10 years. The 100-year flood, or base flood, is the standard that has been

adopted for use in the NFIP. As indicated on Federal Insurance Rate Maps (FIRMs), base flood elevations indicate the elevation of surface water resulting from a flood that has a 1-percent chance of occurring in any given year. The BFE is the height of the base flood, normally in feet, relation to the geographic datum referenced in the FIS report (i.e. National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD) of 1988, etc.) (HIRA-NY, Definitions of Hazards).

6.5.2 Geographic Location

A flood could affect a small region, inundating homes and businesses and knocking out utilities. A flash flood, occurring with little warning, could result in injuries or death. Multiple areas within Oswego County are mapped as 100-year floodplains. These mapped areas include most of the land along the Salmon River between the Salmon River Reservoir and Lake Ontario, along the Oswego River between the County line and Lake Ontario, the Oneida River from Oneida Lake to the Oswego River, and the northern shore of Oneida Lake (Oswego County Hazard Analysis, 2009).

FEMA FIRM mapping was reviewed as part of this analysis. The 100-year floodplains, 500-year floodplains, and areas with no flood mapping are depicted on Figures 6.13.

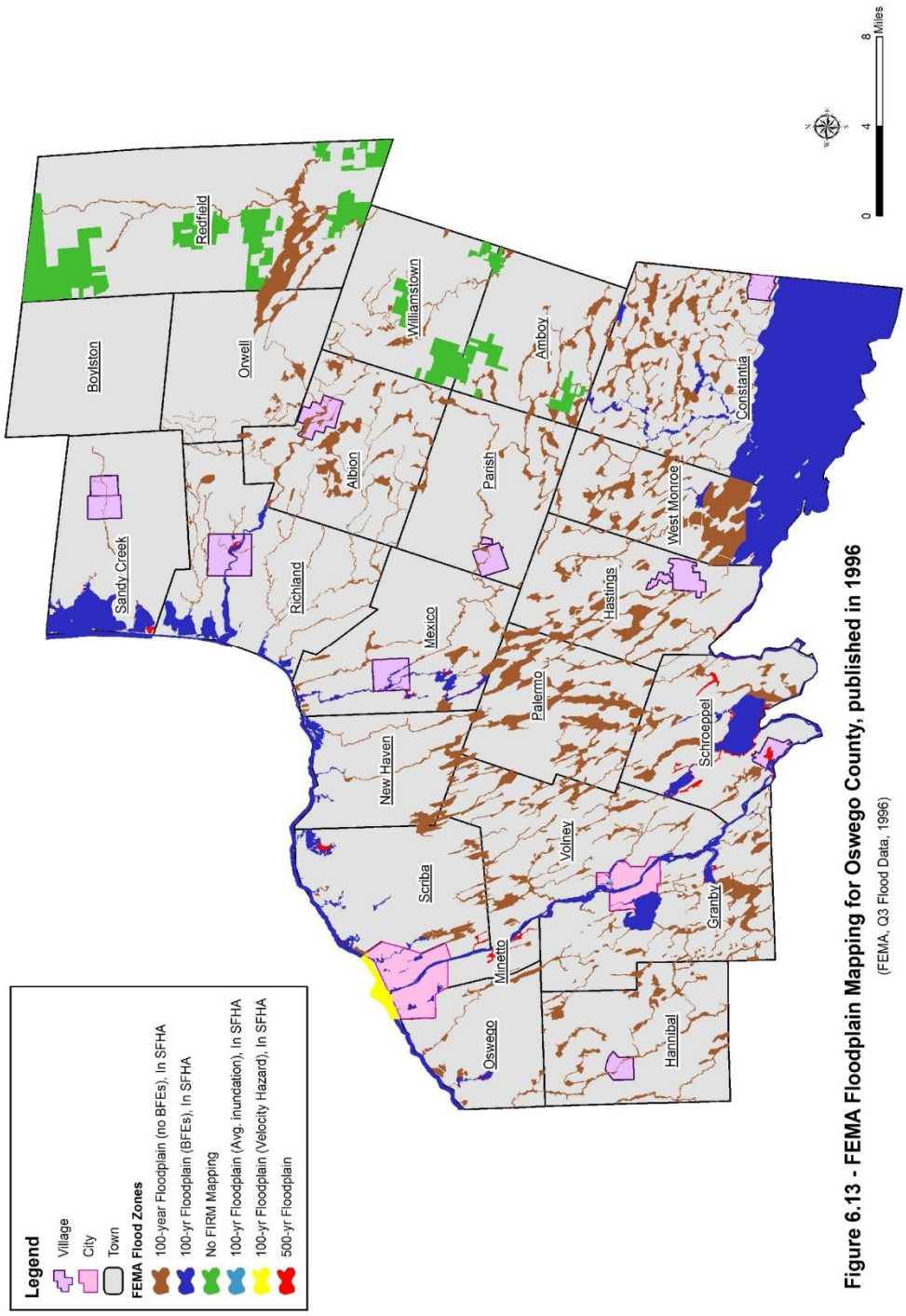


Figure 6.13 - FEMA Floodplain Mapping for Oswego County, published in 1996

(FEMA, Q3 Flood Data, 1996)

As figure 6.13 indicates, 100- and 500-year floodplain areas are widely mapped across almost all jurisdictions within the County. Potential flooding issues could occur at a number of locations, though historic evidence shows that some areas more frequently deal with flooding conditions than others. The Oswego County Office of Real Property quantified the number of parcels within the Towns and Cities located in Oswego County that are mapped within FEMA 100-year floodplain areas. The number of parcels for each jurisdiction and the percent of these parcels included in a 100-year floodplain are displayed in Table 30.

Table 30 – Number of parcels by jurisdiction that are located within 100-year floodplains in Oswego County
(Oswego County Office of Real Property, 2009)

Jurisdiction	Parcels in Jurisdiction	Parcels in 100-Year Floodplains	% of Parcels in 100-Year Floodplains
City of Fulton	4304	354	8.2%
City of Oswego	7120	209	2.9%
Town of Albion	1452	542	37.3%
Town of Amboy	1166	327	28.0%
Town of Boylston	696	8	1.1%
Town of Constantia	2899	1762	60.8%
Town of Granby	3106	1118	36.0%
Town of Hannibal	2090	462	22.1%
Town of Hastings*	4221	864	20.5%
Town of Mexico	2773	658	23.7%
Town of Minetto	816	156	19.1%
Town of New Haven	1624	337	20.8%
Town of Orwell	1274	127	10.0%
Town of Oswego	2186	249	11.4%
Town of Palermo	1849	602	32.6%
Town of Parish*	1441	252	17.5%
Town of Redfield*	1190	162	13.6%
Town of Richland*	3375	957	28.4%
Town of Sandy Creek	3160	857	27.1%
Town of Schroeppel*	3505	998	28.5%
Town of Scriba	2993	523	17.5%

Table 30 – Number of parcels by jurisdiction that are located within 100-year floodplains in Oswego County
(Oswego County Office of Real Property, 2009)

Jurisdiction	Parcels in Jurisdiction	Parcels in 100-Year Floodplains	% of Parcels in 100-Year Floodplains
Town of Volney*	2829	787	27.8%
Town of West Monroe*	1923	958	49.8%
Town of Williamstown	1096	270	24.6%
Oswego County	59088	13539	22.9%

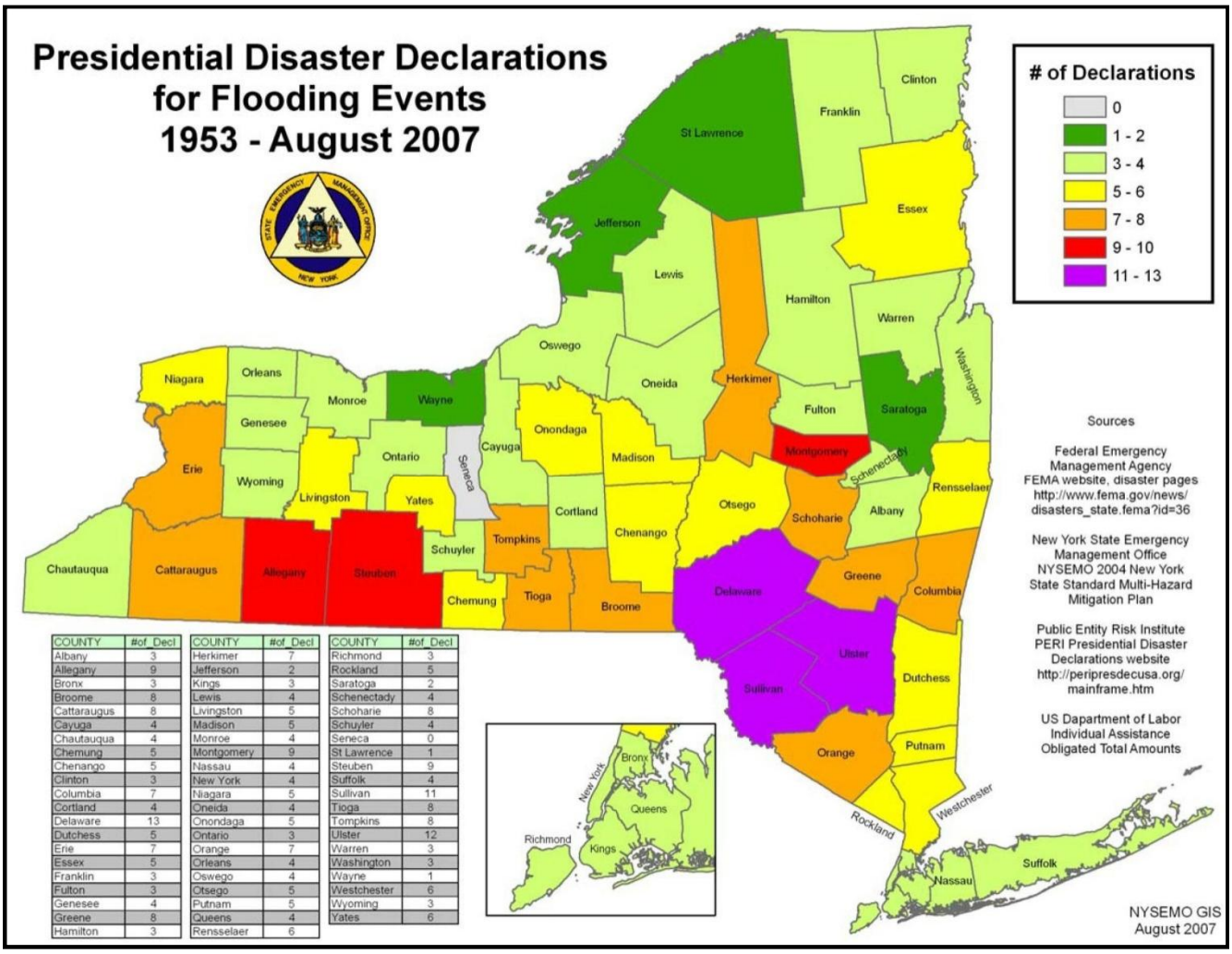
* = Towns not assessed at 100%

Table 30 indicates that 23 percent (23%) of the total parcels in Oswego County are included in mapped 100-year floodplain areas. All 22 Towns located within Oswego County, and the two Cities, indicate some properties located within mapped 100-year floodplain areas. This indicates that flooding could occur within any jurisdiction in the County. This hazard is not limited to a small geographic region due to the wide distribution of major streams and waterbodies throughout and bordering the County.

6.5.3 Historic Occurrence

Flooding is New York State's most consistently damaging natural hazard, though Oswego County experiences fewer floods than many other Counties in the State. Figure 6.14 shows the number of Presidential Disaster Declarations that have been issued for flooding events between 1953 and August 2007 for all the Counties in New York State. This figure shows that Oswego County has had three (3) Presidential Disaster Declarations issued for flooding events that occurred between 1953 and 2007.

Figure 6.14 – Presidential Disaster Declarations for flooding events in New York State, 1953 – August 2007 (NYSEMO, NYS Hazard Mitigation Plan, 2009)



COUNTY	#of_Decl
Albany	3
Allegany	9
Bronx	3
Broome	8
Cattaraugus	8
Cayuga	4
Chautauqua	4
Chemung	5
Chenango	5
Clinton	3
Columbia	7
Cortland	4
Delaware	13
Dutchess	5
Erie	7
Essex	5
Franklin	3
Fulton	3
Genesee	4
Greene	8
Hamilton	3

COUNTY	#of_Decl
Herkimer	7
Jefferson	2
Kings	3
Lewis	4
Livingston	5
Madison	5
Monroe	4
Montgomery	9
Nassau	4
New York	4
Niagara	5
Oneida	4
Onondaga	5
Ontario	3
Orange	7
Orleans	4
Oswego	4
Otsego	5
Putnam	5
Queens	4
Rensselaer	6

COUNTY	#of_Decl
Richmond	3
Rockland	5
Saratoga	2
Schenectady	4
Schoharie	8
Schuyler	4
Seneca	0
St Lawrence	1
Steuben	9
Suffolk	4
Sullivan	11
Tioga	8
Tompkins	8
Ulster	12
Warren	3
Washington	3
Wayne	1
Westchester	6
Wyoming	3
Yates	6

Only one of the three presidentially declared flood events that affected Oswego County could be located. Prior to 1998, records of Presidential Disaster Declarations do not have detailed event information, including the designated Counties identified to receive funding from each disaster. Disaster number DR-725 occurred on September 25, 1984, in western New York. The eligible damages from this flood event totaled $3.3 million dollars. Within Oswego County, flooding occurred along the Salmon River, causing property damage to, and the evacuation of, several communities within the river corridor.

Aside from the declared disaster event above, 10 other records of extensive flood events were reported for Oswego County, though none of these events were declared. Table 31 includes information describing these additional hazard events.

Table 31 – Historic undeclared flood events reported to occur in Oswego County between 1635 and October 2009 (NOAA, NCDC, Storm Events Search, 2009 and NYSEMO, NYS Hazard Mitigation Plan, 2009 and Oswego County Hazard Analysis, 2009)

Location	Date	Event	Magni-tude	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
Oswego County – Salmon River	1903	Flood	N/A	Unk	Unk	Unk	Unk
Oswego County – Salmon River	1973	Flood	N/A	Unk	Unk	Unk	Unk
Oswego County	July 1974	Flood	N/A	Unk	Unk	Unk	Unk
Oswego County	May 1976	Flood	N/A	Unk	Unk	Unk	Unk
Oswego County	1993	Flood	N/A	Unk	Unk	Unk	Unk
Shoreline of Oneida Lake and Oneida River experienced flooding							
Oswego County	4/16/1994	Flood	N/A	0	0	$5,000	0
Spring rains and snowmelt combined to raise the level of Oneida Lake above flood stage. Flooding occurred primarily along the south shore over low lying roads in the area.							
Oswego County	7/18/1994	Flash Flood	N/A	0	0	$50,000	0
Hannibal	11/8/1996	Flash Flood	N/A	0	0	$18,000	0
3-4” of rain fell over approx. 12 hours resulting in flash flooding. Several roads were closed due to flood waters. Power disruptions were reported.							
Hannibal	1/8/1998	Flash Flood	N/A	0	0	$12,000	0
Unprecedented rainfall over 36 hour period. Numerous roads were closed due to flood waters. Water had to be pumped from residential basements. Flood waters overwhelmed several WWTP, requiring the declaration of several water emergencies.							
Fulton	7/2/1999	Flash Flood	N/A	0	0	$5,000	0
Constantia	8/5/2003	Flash Flood	N/A	0	0	$25,000	0
Thunderstorms during late morning and afternoon produced downburst winds up to 60 mph. The winds downed trees and power lines in Constantia. Flooded roads were closed.							
Fulton & Minetto	Jan 2004	Flood	N/A	0	0	Unk	0
Flooding of the Oswego River occurred as a result of an ice jam.							
Hannibal	7/28/2006	Flash Flood	N/A	0	0	$100,000	0
Heavy rains in Northern Finger Lakes Region. Roads and residential basements became inundated.							
Totals:	**--**	**--**	**--**	**0**	**0**	**$215,000**	**0**

6.5.4 County Vulnerability and Probability of Future Events

Flooding within Oswego County is seen as a regular event that occurs between once a year and once every other year. Potential cascading effects from flood events include dam failure, fire, hazmat (fixed site), oil spill, structural collapse, transportation accident, utility failure, and water supply contamination. Flooding is a concern to the County as a whole, especially along Lake Ontario, Oneida Lake, and the Salmon River, where historic events of large-scale flooding have been documented. Flood events are more likely to significantly impact these specific areas of the County than to impact the entire County at one time.

Oswego County is ranked as the 11th County in New York State to be most threatened by flooding and most vulnerable to flood loss. This designation comes from a vulnerability assessment that was conducted in 2004 as part of the New York State Hazard Mitigation Plan. This analysis was based on NFIP flood data and ranks all 62 Counties within the State, listing Oswego as the 11th most threatened and most vulnerable County. Tables 32 and 33 detail the NFIP data for Oswego County as a whole and the individual jurisdictions located in the County.

Table 32 – NFIP and County Data from 2009 for Oswego County
(Oswego County Real Property, 2009 and NYSEMO GIS, 2007)

# of NFIP insurance policies	411
total NFIP claims (#)	187
total NFIP claims paid ($)	$1,054,932.02
total NFIP policy coverage ($)	$56,802,500
of repetitive flood loss properties (#)	10
total of repetitive losses paid ($)	$488,059
value of residential parcels in 100yr floodplain ($)	$3,320,269,047
% of value of residential parcels in 100yr floodplain(%)	46.4%
Presidential Disaster Declarations for flooding in Oswego County (#)	3

Coastal flooding is also probable within Oswego County. The west/northwest boundary of the County borders Lake Ontario; low lying properties around the lake are frequently inundated and eroded as a result of minor coastal flooding events. Figure 6.15 shows the coastal boundary area within Oswego County where this type of flooding commonly occurs. Figure 6.16 displays the numbers of residential properties and their associated property values that are located within mapped 100-year floodplains within each municipality in Oswego County. This data combines to show County-wide residential property exposure to flooding events.

Figure 6.15 – Coastal boundaries of New York State are depicted in blue. The coastal area along Oswego County is where historic occurrences of coastal flooding have been reported (NYSEMO, NYS Hazard Mitigation Plan, 2009)

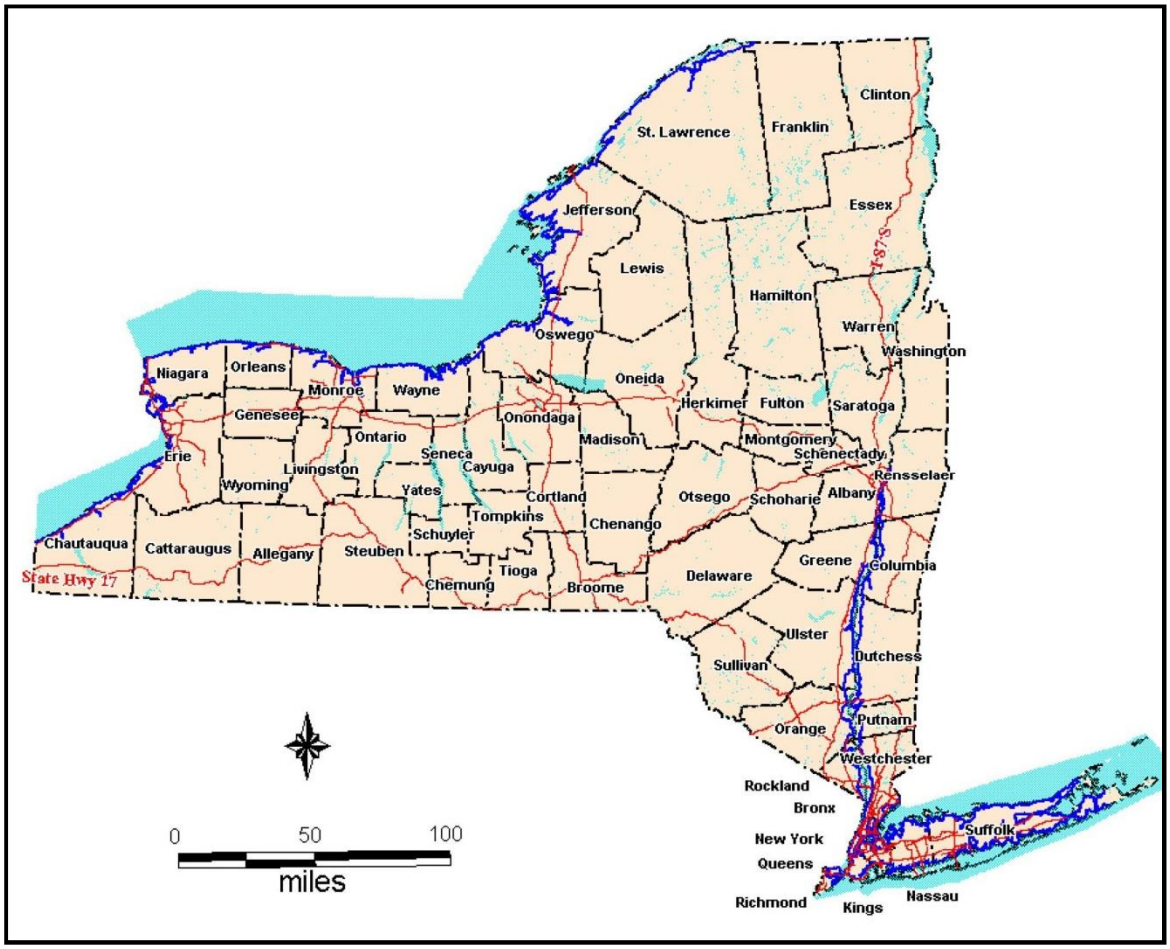
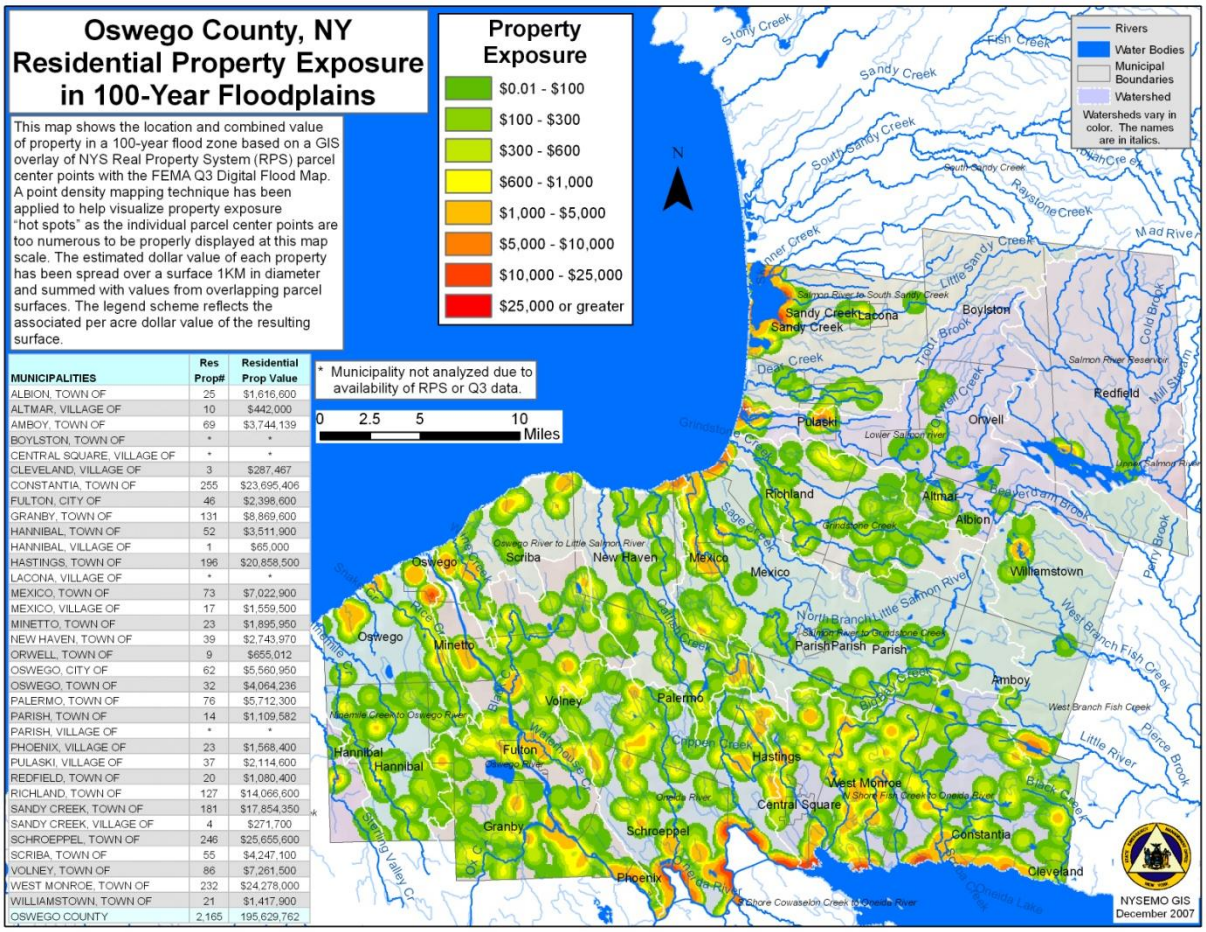


Figure 6.16 – Residential Property Exposure in 100-Year Floodplains
(NYSEMO GIS, 2007)



MUNICIPALITIES	Res Prop#	Residential Prop Value
ALBION, TOWN OF	25	$1,616,600
ALTMAR, VILLAGE OF	10	$442,000
AMBOY, TOWN OF	69	$3,744,139
BOYLSTON, TOWN OF	*	*
CENTRAL SQUARE, VILLAGE OF	*	*
CLEVELAND, VILLAGE OF	3	$287,467
CONSTANTIA, TOWN OF	255	$23,695,406
FULTON, CITY OF	46	$2,398,600
GRANBY, TOWN OF	131	$8,869,600
HANNIBAL, TOWN OF	52	$3,511,900
HANNIBAL, VILLAGE OF	1	$65,000
HASTINGS, TOWN OF	196	$20,858,500
LACONA, VILLAGE OF	*	*
MEXICO, TOWN OF	73	$7,022,900
MEXICO, VILLAGE OF	17	$1,559,500
MINETTO, TOWN OF	23	$1,895,950
NEW HAVEN, TOWN OF	39	$2,743,970
ORWELL, TOWN OF	9	$655,012
OSWEGO, CITY OF	62	$5,560,950
OSWEGO, TOWN OF	32	$4,064,236
PALERMO, TOWN OF	76	$5,712,300
PARISH, TOWN OF	14	$1,109,582
PARISH, VILLAGE OF	*	*
PHOENIX, VILLAGE OF	23	$1,568,400
PULASKI, VILLAGE OF	37	$2,114,600
REDFIELD, TOWN OF	20	$1,080,400
RICHLAND, TOWN OF	127	$14,066,600
SANDY CREEK, TOWN OF	181	$17,854,350
SANDY CREEK, VILLAGE OF	4	$271,700
SCHROEPPEL, TOWN OF	246	$25,655,600
SCRIBA, TOWN OF	55	$4,247,100
VOLNEY, TOWN OF	86	$7,261,500
WEST MONROE, TOWN OF	232	$24,278,000
WILLIAMSTOWN, TOWN OF	21	$1,417,900
OSWEGO COUNTY	2,165	195,629,762

6.5.5 Damage Estimates

Table 33 – NFIP Report for Jurisdictions in Oswego County, 1978 – 2009
(Bureau Net, Claim and Policy Information, 2009)

Jurisdiction	# of policies	Total coverage ($)	# Claims since 1978	Total paid since 1978 ($)
Town of Albion	2	$556,000	1	$0
Village of Altmar	1	$46,200	9	$77,514
Town of Amboy	2	$96,700	0	$0
Town of Boylston	1	$350,000	0	$0
Village of Central Square	3	$354,500	4	$4533
Village of Cleveland	6	$1,311,900	32	$164,171
Town of Constantia	47	$6,822,900	16	$145,089
City of Fulton	11	$1,548,600	10	$15,463
Town of Granby	17	$1,766,200	1	$5,164

Table 33 – NFIP Report for Jurisdictions in Oswego County, 1978 – 2009
(Bureau Net, Claim and Policy Information, 2009)

Jurisdiction	# of policies	Total coverage ($)	# Claims since 1978	Total paid since 1978 ($)
Village of Hannibal	1	$140,000	0	$0
Town of Hastings	57	$8,237,300	8	$36,876
Town of Mexico	13	$2,418,000	2	$0
Village of Mexico	4	$632,800	9	$9,316
Town of Minetto	5	$887,600	2	$1,596
Town of New Haven	4	$373,300	1	$0
City of Oswego	16	$1,788,200	13	$381,869
Town of Oswego	7	$611,100	5	$1,924
Town of Parish	2	$168,000	2	$9,937
Village of Phoenix	12	$1,608,100	1	$624
Village of Pulaski	11	$1,379,800	4	$1,171
Town of Redfield	1	$105,000	0	$0
Town of Richland	13	$1,983,700	7	$4,494
Town of Sandy Creek	34	$4,4994,900	12	$27,035
Village of Sandy Creek	1	$210,000	0	$0
Town of Schroeppel	58	$7,020,200	19	$45,444
Town of Scriba	16	$2,071,600	10	$29,404
Town of Volney	4	$832,500	1	$0
Town of West Monroe	62	$8,451,400	18	$93,308

Jurisdictions not included in Table 33 (Town of Hannibal, Village of Lacona, Town of Orwell, Town of Palermo, Village of Parish, Town of Williamstown) did not have any flood insurance policies to report in 2005. Therefore, these jurisdictions did not have any claims or flood insurance monies paid between 1978 and 2005. These jurisdictions include: Village of Hannibal, Village of Lacona, Village of Sandy Creek, Town of Williamstown, Village of Parish, Town of Palermo, Town of Amboy, Town of Boylston, and Town of Orwell. The average amount paid through the NFIP based on the total number of claims submitted between 1978 and 2005 is $5,695. The Towns of Constantia, Hastings, and Schroeppel have the highest numbers of current NFIP policies and the largest amount of flood insurance coverage according to the 2005 data. This data also

shows that the Village of Cleveland submitted the most claims with a total of 30, but that the City of Oswego received the largest total amount paid since 1978 with $381,868.

Along with the specific claims and payments associated with the NFIP is the total value of parcels of land within each jurisdiction that are classified as vulnerable because of their location within FEMA's mapped 100-year floodplains. Table 34 totals the value of all parcels within each jurisdiction as well and the total value and total percentage of value of those parcels which are vulnerable to flooding.

Table 34 – Value and number of parcels by jurisdiction that are located within 100-year floodplains in Oswego County (Oswego County Office of Real Property, 2009)

Jurisdiction	Value of parcels in 100 year floodplain ($)	Value of all parcels within specific jurisdiction ($)	% of value of parcels located in 100 yr floodplain
City of Fulton	$111,443,885	$441,829,432	25.2%
City of Oswego	$279,293,287	$1,072,823,732	26.0%
Town of Albion	$31,614,550	$71,722,950	44.1%
Town of Amboy	$18,786,393	$56,895,504	33.0%
Town of Boylston	$575,800	$34,404,500	1.7%
Town of Constantia	$188,720,036	$278,277,539	67.8%
Town of Granby	$88,755,155	$229,429,415	38.7%
Town of Hannibal	$42,577,800	$147,777,265	28.8%
Town of Hastings*	$77,833,973	$415,027,348	18.8%
Town of Mexico	$67,959,292	$254,129,295	26.7%
Town of Minetto	$35,677,880	$102,590,950	34.8%
Town of New Haven	$25,109,550	$118,418,279	21.2%
Town of Orwell	$72,979,841	$146,700,765	49.7%
Town of Oswego	$27,242,950	$216,240,105	12.6%
Town of Palermo	$38,527,905	$124,137,525	31.0%
Town of Parish*	$13,463,222	$84,791,558	15.9%
Town of Redfield*	$14,398,876	$59,119,736	24.4%
Town of Richland*	$111,313,896	$293,111,707	38.0%
Town of Sandy Creek	$82,828,142	$258,880,776	32.0%
Town of Schroeppel*	$95,295,012	$322,047,539	29.6%
Town of Scriba	$1,800,835,992	$2,100,517,134	85.7%

Table 34 – Value and number of parcels by jurisdiction that are located within 100-year floodplains in Oswego County (Oswego County Office of Real Property, 2009)

Jurisdiction	Value of parcels in 100 year floodplain ($)	Value of all parcels within specific jurisdiction ($)	% of value of parcels located in 100 yr floodplain
Town of Volney*	$77,441,750	$271,899,035	28.5%
Town of West Monroe*	$3,886,149	$7,185,909	54.1%
Town of Williamstown	$13,707,711	$52,322,009	26.2%
Oswego County	$3,320,269,047	$7,160,280,007	46.4%

These numbers indicate that 46.4-percent of the total value of all properties within Oswego County is located within 100-year floodplains. Such a high percentage would indicate that some of the most valuable land within Oswego County consists of waterfront along its many streams and lakes; waterfront property is usually valued at a higher rate.

The City of Oswego and the Town of Scriba are designated as having the most total parcel value and the highest total value of properties located within the 100-year floodplain. The Town of Scriba and the Town of Constantia have the highest percentage of value of property located within 100-year floodplain areas. Numerous waterfront properties line the northern shore of Oneida Lake in the Town of Constantia, which shows why the percentage of value of properties within flood-prone areas is so high. In the Town of Scriba, the nuclear power plant facilities are located within a 100-year floodplain area along the shore of Lake Ontario. This increases the percentage value and total value of properties located within the 100-year mapped floodplain.

Flooding was designated as a moderately low hazard within Oswego County, but it is one that has the potential to impact a large number of properties, but likely not all at the same time. It appears that minor damage occurs at an infrequent rate to a small amount of properties within most of the jurisdictions in the County. Nineteen of the 25 jurisdictions that completed their own risk analyses, included flooding as

one of their evaluated hazards. It is important to note that only 10 properties are documented as exhibiting repetitive flood loss. These 10 properties and their locations are detailed in Table 46 (Section 8.6.1). Mitigation activities such as property acquisition may help to eliminate repetitive damage to the same properties as a result of flood events.

6.6 Wildfire Hazard Profile

6.6.1 Hazard Description

A wildfire is defined as an uncontrollable combustion of trees, brush, or grass involving a substantial land area which may have the potential for threatening human life and property. Dry conditions at various times of the year can increase the potential for wildfire events. Often, wildfires begin abruptly and spread quickly, creating a dense smoke that can fill the surrounding area for miles. Humans start four out of every five wildfires, usually as debris burns, arson, or carelessness. Lightning strikes are the second most leading cause of wildfires.

Wildfire behavior is primarily based on three factors: fuel, topography, and weather. The type, amount, burning qualities, and level of moisture affect wildfire potential and behavior. Topography is important because it affects the movement of air over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity, and wind affect the severity and duration of wildfires (HIRA-NY, Definitions of Hazards).

Wildland Fires

These types of fires are almost exclusively fueled by native vegetation. Wildland fires typically occur in national forests and parks where specific agencies are responsible for fire management and suppression. These fires are most frequent in areas in which development is essentially nonexistent, except for roads, railroads, power lines, and similar facilities.

Interface or Intermix Fires

These types of fires are urban/wildland fires in which vegetation and the built-environmental provide fuel. Interface fires predominantly occur in geographical areas where structures and other human development meet or intermingle with wildland or vegetative fuels.

Firestorms

Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted.

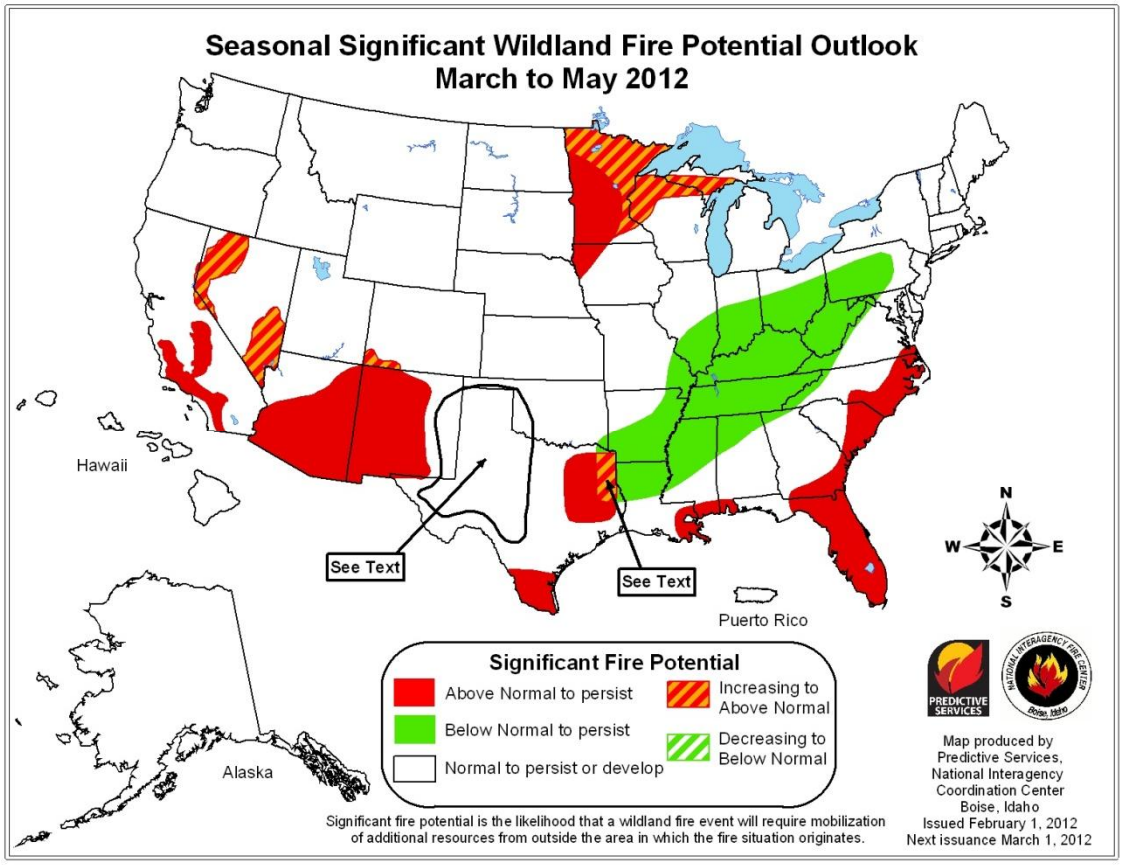
Prescribed fires

These types of fires are intentionally set or selected natural fires that are allowed to burn for beneficial purposes. These fires are commonly termed prescribed burns (FEMA, Part 1 Natural Hazards, Subpart E).

6.6.2 Geographic Location

Wildfires have the potential to occur throughout the County, especially outside of the Villages and Cities. Large wildfires are not known to occur within Oswego County; therefore, this area of the Country is not included in the seasonal wildfire watch area shown on Figure 6.17. No major wildfires, which constitute over 100,000 acres in size, have ever been reported within Oswego County.

Figure 6.17 – Areas within the U.S. with significant fire potential during the winter season – this online map is updated seasonally (NICC, 2012)



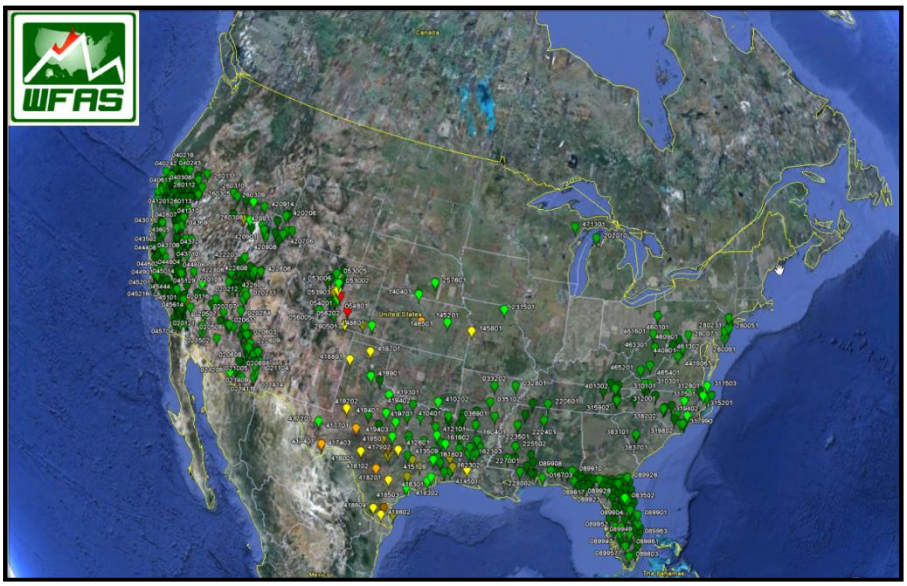
6.6.3 Historic Occurrences

Multiple reports of minor wildfires have been reported within Oswego County. These events have mostly occurred in fields or on undeveloped lands. The most severe wildfire event occurred in 2008 in the Town of Schroeppel. This fire destroyed a barn and the livestock housed there. In addition, between April 2008 and March 2009, the County Fire Coordinator requested that the Chairman of the County Legislature declare a state of emergency and issue a local order to ban outdoor burning, because of the strain on volunteer fire resources from battling wildfires.

6.6.4 County Vulnerability and Probability of Future Events

Wildfires are noted as being a regular event in Oswego County, occurring between once a year and once every seven years. Though the County may be vulnerable to such events, they are normally not large and do not incur significant damage or injuries. A small potential for cascading effects was determined. Examples of some potential cascading effects of wildfires include air contamination, explosion, fire, and structural collapse. Wildland Fire Assessment System was analyzed to determine whether any fire danger observations were mapped for Oswego County. These results are depicted by Figure 6.18.

Figure 6.18 – Wildland Fire Assessment System results showing fire weather and fire danger observation results (USFS, WFAS, 2010)



6.6.5 Damage Estimate

Wildfires are a moderately low hazard in Oswego County because they occur mostly in undeveloped areas of the County and cause little or no structural damage to private property or public facilities. The main cause of these wildfires has been open burning during periods of dry, windy weather. These events place unneeded strain on volunteer fire services, since such fires require substantial manpower to extinguish. Through mitigation activities such as public education and the issuance of weather related open burn warnings, the threat of this hazard can be minimized within the County.

6.7 Winter Storm (Severe) Hazard Profile

6.7.1 Hazard Description

A severe winter storm is described as a storm system that develops in late fall to early spring and deposits wintry precipitation, such as snow, sleet, or freezing rain, with a significant impact on transportation systems

and public safety. According to the HIRA-NY definitions of hazards, a severe winter storm could meet the following definitions:

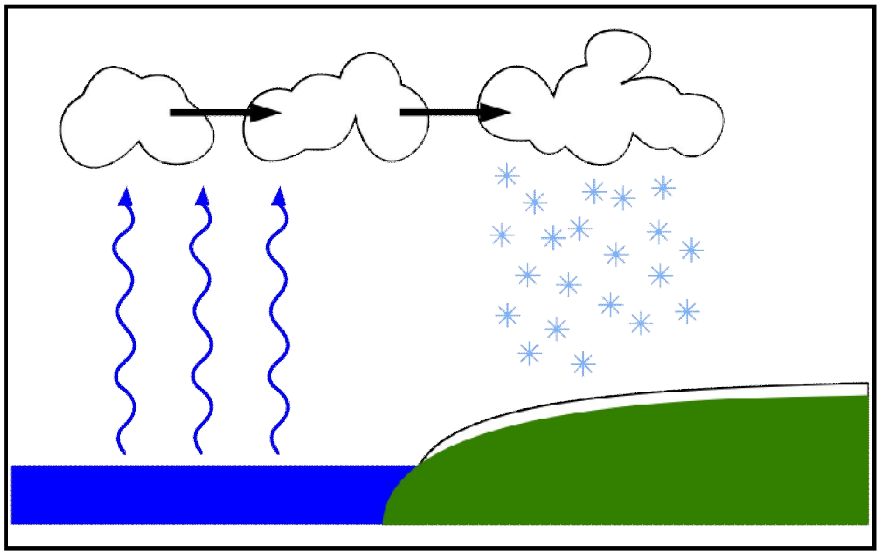
- Heavy snow: at least 6 inches in 12 hours or less;
- Blizzard: low temperatures, winds 35 mph or greater, and sufficient falling and/or blowing snow in the air to frequently reduce visibility to ¼ mile or less for a duration of at least three hours; or
- Severe blizzard: temperatures near or below 10°F, winds exceeding 45 mph, and visibility reduced by snow to near zero for a duration of at least 3 hours.

In many locations throughout the United States, the occurrence of a storm meeting the above criteria would undoubtedly pose a problem; however, because heavy snow is such a common event in Oswego County, the definition for severe winter storm was modified for this analysis. For the purposes of this hazard analysis, a severe winter storm is defined as a heavy lake effect snow storm that puts the County into an emergency condition and perhaps requires the opening of an emergency operations center. A review of recent history indicates that such storms often have a snowfall rate of 2-4 inches per hour or more. A heavy snowfall outside of the normal snow season (approx. November 1 – March 31) would have more of an impact given that heavy snow fall on trees with their leaves would have the potential to bring down an increased number of branches and utility lines (Oswego County, Hazard Analysis, 2009). Severe winter storms (Nor'easters) sometimes result from a coastal storm hazard event that makes its way along the coast of the Northeast U.S.

Lake Effect Snow

Lake effect snow is a localized snowfall that is most common from November to February. Such a snow event is characterized by a large volume and a high rate per hour of snowfall, often described as a 'heavy' snowfall. These snows form in the winter when cold air masses move over warmer lakes; specifically, Lake Ontario in Oswego County's case. As the bottom layer of air is warmed by the lake water, moisture from the lake evaporates into the cold air. This moisture rises and begins to cool, evaporating into the air. This air then condenses, forming clouds, and producing snow that falls to the ground. Snow clouds most often form in narrow bands where the size and orientation change according to the shape of the body of water and the prevailing wind direction. Figure 6.19 shows a simple diagram depicting the progression of lake effect snow.

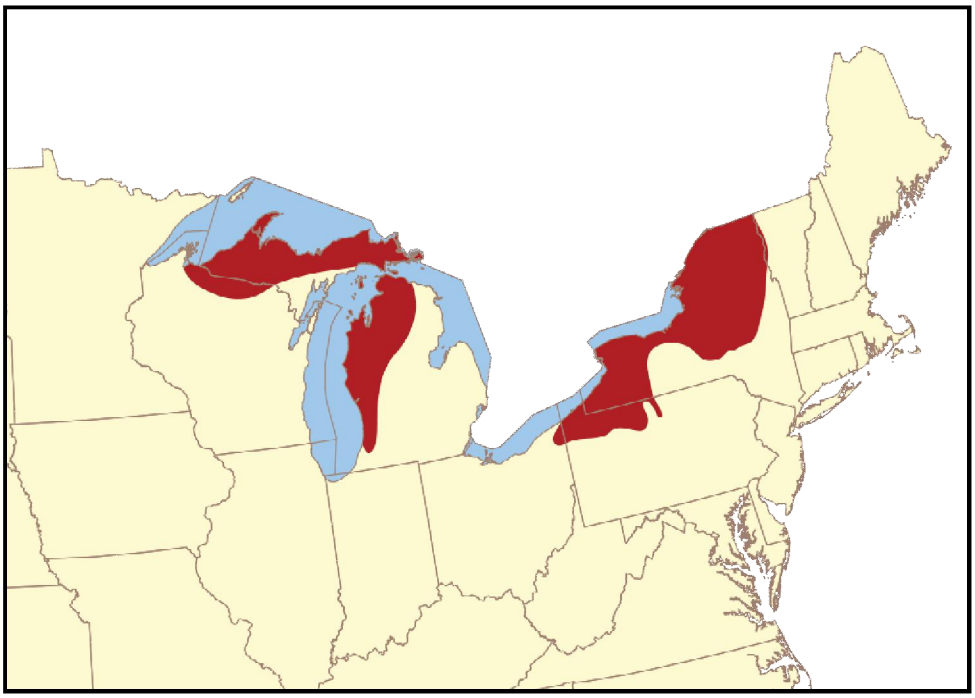
Figure 6.19 – Diagram Showing the Lake Effect Snow Process



Locations in these narrow bands may see up to 5 inches or more of snow an hour, and may also experience thunder and lightning. A band of snow may remain over one location for several hours, depositing multiple feet of snow, while 10 miles on either side of the band experience sunny

skies and no evidence of recent snowfall. Lake effect snows can be generated by any large body of water, though they are most common and are heaviest in the Great Lakes Region (Figure 6.20) (NOAA, Monitoring and Understanding Our Changing Planet, 2010).

Figure 6.20 – Areas most susceptible to lake effect snowstorms



6.7.2 Geographic Location

A severe winter storm can affect a small or large region of the County or the entire County at one time. A single storm can also move from one area to another and back again, making the exact locations of affect nearly impossible to predict. Severe storms have the ability to immobilize an entire portion of the County, severely limiting the ability of emergency agencies to respond to local emergencies.

6.7.3 Historic Occurrence

The National Climatic Data Center shows that between January 1950 and October 2009, 129 heavy snow events occurred within Oswego County. These events vary is severity, ranging in property damage from $5,000 to $46.5 million. Ten winter storm events are also reported by the NCDC. These storms occurred on the following dates: January 4, 1996; March 14, 1997; January 2, 1999; January 15, 1999; January 14, 2007; February 1, 2008; March 4, 2008; March 7, 2008; October 28, 2008; and December 19, 2008. Since 1950, only one fatality has been documented as a result of heavy snowfall events within Oswego County.

The “Blizzard of 1966” is among the most severe snowstorms to affect Oswego County. It began as a nor’easter which affected the New York City metro area and was followed by heavy “wraparound” lake effect snows. Winds were more than 60 miles per hour (mph) during the storm. The snow was badly drifted and roads and schools were closed as long as a week. Drifts covered entire 2-story houses. The storm occurred from January 27 to January 31, 1966. A total of 102 inches of snow was recorded in the City of Oswego.

The “Blizzard of 1993”, which struck the east coast and resulted in a federal declaration of disaster for New York State (3107 EM), dropped almost 5 feet of snow on the City of Oswego in 48 hours, between March 12 and 13, 1993.

Within recent history, two County-wide states of emergency have been declared for lake effect snow storms. Between February 3 and February 4, 2004, a lake effect snow storm impacted the Oswego River Corridor and the central section of the County, but caused little damage to the northern section. The NCDC documents that 8 to 10 inches of snow fell within a 10-hour period. FEMA declared a Snow Emergency for the

County and ultimately paid $2,434,764 in public assistance eligible for reimbursement.

A more widespread lake effect storm system impacted Oswego County from February 3 to February 12, 2007. Oswego County opened and operated an Emergency Operations Center from February 8 to February 21, a total of 13 days. Oswego County was declared a State Disaster Area on February 8 and New York State's Transportation Infrastructure Group (TIG) was mobilized to assist the County in snow removal. A Presidential Declaration for a Snow Emergency resulted in a total of $783,341 awarded in public assistance to the County, its municipalities, and public agencies.

6.7.4 County Vulnerability and Probability of Future Events

Past history indicates a severe winter storm is a regular event likely to occur between once a year and once every seven years. According to the NCDC, heavy snow events appear to occur multiple times every year. The lake effect snow phenomenon creates much unpredictability as far as locations that will be impacted by a snow event and the total amount of snow that a particular location may receive. Due to the closeness of Lake Ontario, the entire County of Oswego is vulnerable to heavy lake effect snow events. Such events have a high potential for cascading effects, including structural collapse and transportation accidents. Jurisdictions located within and adjacent to the Tug Hill Region (Town of Redfield, Town of Williamstown, Town of Albion, Town of Boylston, Town of Amboy, Town of Orwell, Town of Constantia, Town of Hastings, Town of Parish, Town of West Monroe, Village of Parish, Village of Central Square, Village of Altmar, and Village of Cleveland) frequently receive greater amounts of snowfall due to their topographic elevations and close location to Lake Ontario.

6.7.5 Damage Estimate

Due to the frequency of lake effect snowstorms affecting Oswego County, the County and municipalities own numerous pieces of equipment used to move snow and treat roadways. Even though County governments and residents are used to dealing with large amounts of snow, lake effect snow events can deposit so much snow in an area over a short period of time that even being prepared and owning appropriate equipment does not combat the situation. Events of this scale, noted in recent years by the two emergency declarations, are tough to predict. Events at this scale cause the most damage and often require the establishment of emergency response services and/or facilities. The harshest effect of a severe winter storm in Oswego County is the loss of utilities, particularly power.

While a severe winter storm may require an emergency operations center to direct and assist emergency response agencies, damage to private property and public facilities would likely be minimal. The majority of the NCDC records for heavy snows in Oswego County document property damage within the $5,000 - $50,000 range per storm. Damage to critical facilities within the County and municipalities is assumed to be negligible for the most part. The most important critical facilities have generator systems to provide backup power. The installation of generators in additional critical facilities is one way to decrease potential impacts to important facilities and resources and will be included as a potential hazard mitigation action in Section 8.

6.8 Ice Jam Hazard Profile

6.8.1 Hazard Description

Although a large amount of information associated with ice jam events has been collected since the early 1900's, documentation of the actual rate of occurrence of such events is not easily obtained. The lack of information on ice jams can be attributed, in part, to the fact ice jam events are often short-lived and often affect only a localized reach or area of a body of water (U.S. Army CRREL, 2004).

An ice jam is described as a large accumulation of ice in rivers or streams that interrupts the normal flow of water and often leads to flooding conditions and/or damage to nearby structures (HIRA-NY, Definitions of Hazards). Ice jams include those that form in early winter as ice formation begins (freeze-up jams), those that form as a result of the breakup of ice (break-up jams), and those that contain elements of both types (combination jams). Ice jam events can include ice jams, the formation of an ice cover which raises water levels upstream or decreases water levels downstream, or ice cover breakup (U.S. Army Corps CRREL, 2004). Freeze-up jams typically occur early to mid-winter and are made up of slush ice that freezes in place. Break-up jams occur during periods of thaw and are made up of broken pieces of ice from the breaking-up of solid, surface ice (Montana Dept. Military Affairs, 2010). Figure 6.16 depicts locations of ice jam incidents within the U.S.

Specific areas along a stream are more apt to form an ice jam than others (Montana Dept. Military Affairs, 2010):

- ***Flat stream slopes*** – where the slope of the river or stream flattens out; there is not enough slope for gravity to move ice further toward the stream channel;

- ***Narrowed channels*** – where the stream channel is naturally narrow, where the channel has been channelized or modified with rip rap, where there are bridge or other flow constrictions, or other areas where there is an absence of natural floodplain;
- ***Downstream of open water*** – ice can continually form where there are open water areas, contributing ice to the stream; these pieces of ice can accumulate in narrow places downstream; and
- ***Floodplains*** – naturally, floodplains act as places for floating ice and debris to fall out of the stream channel. If structures or stream modifications alter the natural pattern and location of the floodplains, the possibility of flooding and ice build-up increases.

6.8.2 Geographic Location

Ice jams have commonly occurred in Oswego County along the Oswego River and have the potential to also form along the Oneida River and Salmon River. The jurisdictions that border the main channels of the three major river systems identified above are shown in Figure 6.21. While ice jams normally are a cause for concern, in Oswego County they have caused little or no damage except to the nearby shoreline and immediately adjacent property.

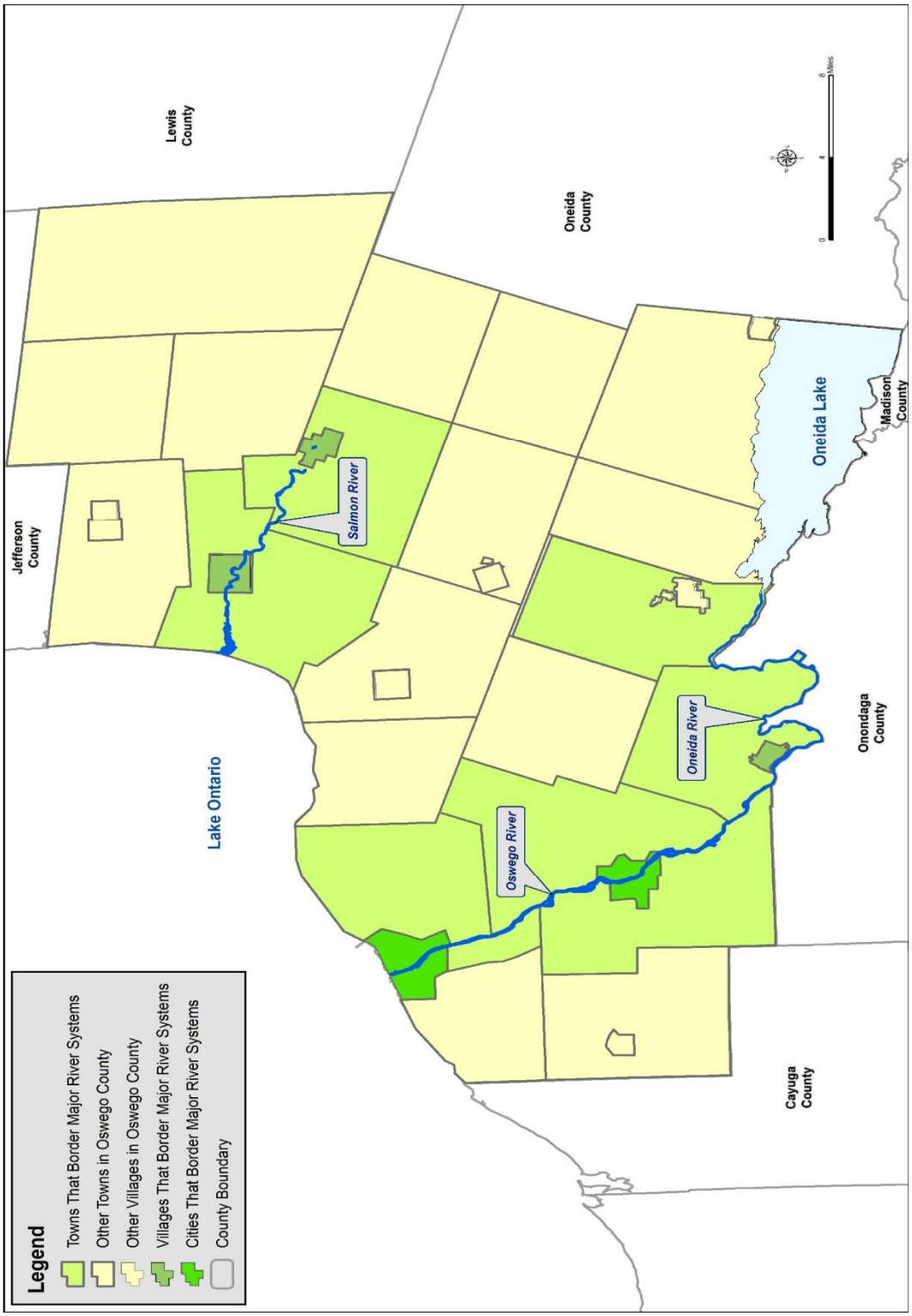


Figure 6.21 - Jurisdictions that border major river systems in Oswego County

6.8.3 Historic Occurrence

Ice jams have occurred in several locations along the Oswego River after a prolonged period of very low temperatures. A low spot in elevation located in the City of Fulton, north of the lower dam, has had occurrences of ice buildup that have impacted a tavern near the shoreline. Ice jams have also occurred north of the City of Fulton, between Hinmansville and the former Miller Brewing property, minimally impacting shoreline property in the Towns of Volney and Granby. An ice jam is reported to have occurred along the border between the Towns of Volney and Scriba in the 1970s, causing minimal damage.

A query of the U.S. Army Corps of Engineers' (USACE) Ice Jam Database was completed to determine records of past ice jam events within Oswego County. Reports of six such hazard events were reported. These records are detailed in Table 35 and the locations of these events are shown in Figure 6.22.

Table 35 – Ice Jam Database Hazard Events in Oswego County
(USACE, CRREL, 2004)

Jam Date	Location	Water	Details
1/20/2004	Town of Minetto	Oswego R	NYSEMO reported an ice jam near Minetto that lasted over 2 weeks, constricted flow to Lake Ontario.
1/20/2004	City of Fulton	Oswego R	NYSEMO reported ice jam between Fulton and Phoenix, hydroelectric plant control gates are frozen, rise in water levels on Oneida and Seneca R.
3/21/2003	Town of Redfield	Salmon R	USGS reported high flows due to ice jam on Salmon R, North Branch.
1/3/1952	City of Oswego	Oswego R	Ice affected stage heights at multiple locations along Oswego River, banks not subject to overflow.
2/18/1916	Village of Altmar	Orwell Br	USGS gage height affected by ice jam at Orwell Brook.
1/7/1915	Village of Altmar	Orwell Br	USGS gage height affected by ice jam at Orwell Brook.

The records included in the USACE Cold Regions Research and Engineering Laboratory (CRREL) are reported from gage heights at USGS gage stations. More frequent events of ice jams likely have occurred

within the County, but are not reported due to their minor nature and/or their location between gage stations.

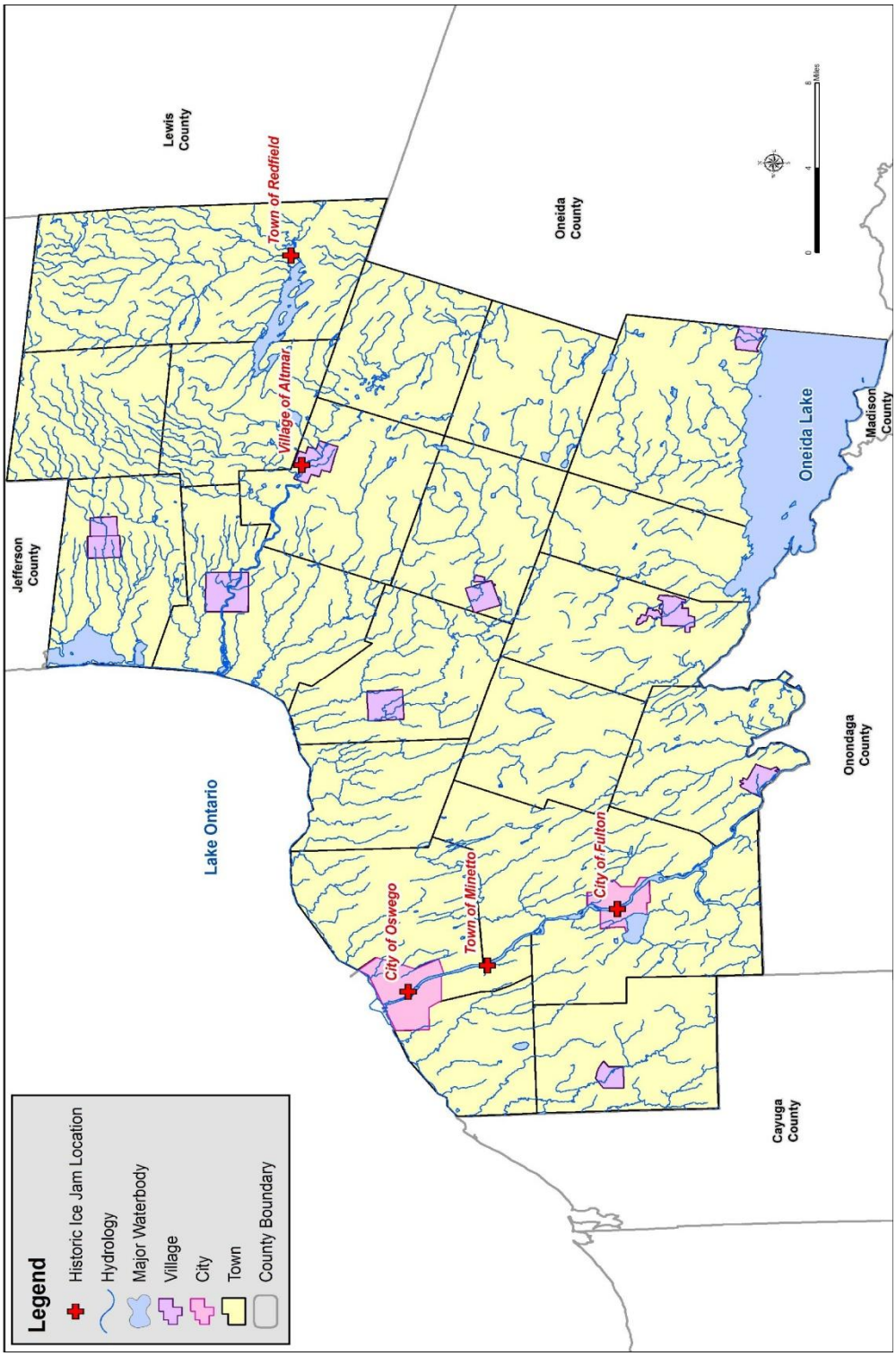


Figure 6.22 - Ice Jam Location, CRREL Database

6.8.4 County Vulnerability and Probability of Future Events

Ice jams within Oswego County are considered to be a regular event, occurring between once a year and once every seven years. Given the number of streams and major river systems located within Oswego County, there is a high probability for future ice jam events to occur within the County.

The County's vulnerability to ice jams is moderately low since serious injury or death is unlikely to occur as a result of such an event. The impact on private property is little to none, while the impact on public facilities is moderate.

6.8.5 Damage Estimate

An ice jam has the potential to cause flooding downstream. Because of this close association, damage estimates for ice jam hazard events are similar to those provided for flood hazard events in Section 6.5.5. Cascading effects from an ice jam could be flooding and associated events such as fire, flood, oil spill, structural collapse, and utility failure. Historical ice jam events have not resulted in anything but minor property damage. Though the main river corridors within the County are also some of the most populated locations, damage is unlikely to occur from ice jam events. It is anticipated that the County would have the equipment and resources to decrease the threat of large ice jams, minimizing the threat of property damage or cascading effects. A severe ice jam event could cause $1 million or more worth of damage, especially if the hazard event created any cascading effects.

6.9 Coastal Storm Hazard Profile

6.9.1 Hazard Description

Coastal storms can cause increases in tidal elevations (called storm surge), wind speed, and erosion, caused both by extratropical events and tropical cyclones. Extratropical events include Nor'easters and severe winter low-pressure systems. The East Coast of the U.S., including Oswego County, can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy snow or rain. These cyclonic storms, commonly referred to as Nor'easters on the East Coast because of the direction of the storm winds, can last for several days and can be very large. Oswego County is not vulnerable to the tropical cyclones that can develop over the North Atlantic Ocean, northeast Pacific Ocean, or the South Pacific Ocean (HIRA-NY, Definitions of Hazards). Water force, wind velocity, and coastal erosion are three factors that are commonly associated with a coastal storm event along the East Coast.

- **Water Force:** During coastal storms, coastal areas will experience flooding with velocity or "wave action", defined as areas subject to receiving waves on top of the rising water from flooding, coastal or inland. The velocity and the force of the water make flooding even more destructive. The velocity and wave action knock over buildings, move debris, erode dunes, scour the shoreline, and displace and redeposit sand.
- **Wind Velocity:** The higher the wind speed, the greater the potential for damage to property. Substantial damage to buildings, vegetation, and infrastructure can occur when wind velocities are high.

- **Coastal Erosion:** Coastal erosion is the weathering of coastal lands. This term is commonly used to describe the horizontal retreat of the shoreline along the ocean, or the vertical down-cutting along the shores of the Great Lakes. Erosion is measured as a rate, with respect to either linear retreat (feet of shoreline recession per year) or volumetric loss (cubic yards of eroded sediment per linear foot of shoreline frontage per year).

6.9.2 Geographic Location

A coastal storm could affect a large region within the County or the entire County. Due to the potential for greater damage in association with coastal erosion, jurisdictions that border Lake Ontario are more likely to be impacted by potential coastal storm events.

6.9.3 Historic Occurrences

Oswego County has been impacted by some of the Nor'easters whose paths have crossed New York State, such as the Blizzard of 1993; however, the impact from these storms has been minimal. Historic Nor'easters that have affected the County have produced effects no more extensive than those that would result from a normal snowstorm.

6.9.4 County Vulnerability and Probability of Future Events

During the Oswego County hazard assessment event it was decided, with additional input from the National Weather Service, to consider the coastal storm hazard and its effects on the County. It was also noted during this event that the effects that the County's vulnerability to a coastal storm is moderately low, because of many of the effects of a Nor'easter can be handled similarly to a winter storm event. A coastal

storm hazard event was determined to be a regular event within Oswego County. Erosion and property damage have been noted along the Eastern Lake Ontario shoreline; these annual occurrences could be escalated by a coastal storm event.

6.9.5 Damage Estimate

Minimal property damage occurs annually within Oswego County as a result of erosion along the Lake Ontario shoreline. This erosion is not a direct result of coastal storm events, but could be increased due to heavy wave action associated with a coastal storm. Minimal damage resulting from coastal storms is expected since the County is prepared and equipped to handle such hazard events.

6.10 Extreme Temperatures Hazard Profile

6.10.1 Hazard Description

Extreme temperatures constitute extended periods of excessive cold or hot weather with a serious impact on human and/or animal populations, particularly the elderly and/or persons with respiratory ailments. Heat kills by pushing the human body beyond its limits. In extreme heat and humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature. Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to heat exhaustion.

Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat

wave than those living in rural areas. Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures known as the heat island effect (HIRA-NY Definitions of Hazards).

Extreme cold temperatures are also most prevalent in elderly populations. Some individuals maintain a low indoor temperature throughout winter in order to use less heat; these types of conditions can be unhealthy and cause frequent sickness or death during prolonged cold periods during the winter months.

6.10.2 Geographic Location

Extreme temperatures can affect a localized region or the entire County. Weather patterns and air movements within a particular area at a particular time will affect the occurrence of extreme temperatures and the length of these occurrences. It is possible for prolonged periods (greater than one week) of extreme hot or cold temperatures to occur anywhere within Oswego County.

6.10.3 Historic Occurrences

Extremely low or high temperatures occur for a period of several days about every other year or every several years. Possibly the coldest recorded temperature in recent Oswego County history occurred in the Town of Redfield during the winter of 2008-2009. Redfield experienced a temperature of 35 degrees below zero Fahrenheit (- 35°F). Many of the northern communities in Oswego County are used to dealing with frequent excessively cold temperatures.

The Midwestern Regional Climate Center (MRCC) has tracked extreme temperature events within many states in the U.S. Data was

available for three jurisdictions located within Oswego County; this data is included in Table 36.

Table 36 – Annual Temperature Extremes for Oswego County (MRCC, 2003)

	Town of Richland	Village of Pulaski	City of Oswego
Begin Date – Data Recording	1904	1948	1926
End Date – Data Recording	1952	1990	2003
High Temperature	98°F	97°F	97°F
Date Recorded	June 21, 1949	July 29, 1964	August 14, 2002
Low Temperature	-26°F	-30°F	-23°F
Date Recorded	January 31, 1948	February 2, 1961	December 29, 1933
Average Minimum During Data Recording	27.9°F	28.3°F	31.7°F
Average Maximum During Data Recording	48.1°F	47.2°F	46.8°F

The NOAA National Climatic Data Center reported two instances since 1950 that were recorded as extreme temperature events. These two events, which both occurred in 1993, affected the majority of New York State, including Oswego County. The details surrounding these two recorded events are included below.

- **Cold Event:** An extreme cold event was reported on February 1, 1993. **Details:** An Arctic high pressure center descended from the Upper Great Lakes Region and moves into northern New York early on February 2nd. A strong pressure gradient which was set up across the area on February 1st produced northerly winds of 15-30 miles per hour. The strong winds coupled with temperatures between 5 below zero and 10 above zero resulted in wind chill readings of 30-40 below zero in many areas. Temperatures fell so fast in some areas that multiple transmission lines

broke, leaving many customers without power. $50,000 of property damage was estimated as a result of this event.

- **Heat Event:** An extreme heat event was reported on October 8, 1993. **Details:** A strong southwesterly flow pushed very mild air into eastern New York resulting in record high temperatures across much of the area, including Albany, Binghamton, and Rosendale. No damage was reported as a result of this heat event.

6.10.4 County Vulnerability and Probability of Future Events

Extreme temperatures could cause serious injury or death but not in large numbers. Extreme temperatures are a regular event, occurring between once a year and once every seven years. None of the recent extreme temperature events have caused any concerns regarding an increase in frequency or severity of such events within Oswego County or the County's ability to handle such events. There is some potential for cascading effects to accompany extreme temperature events. Such cascading effects include air contamination, fire, ice jams, transportation accidents, and utility failure.

6.10.5 Damage Estimate

One of the most effective courses of action that could be taken to prepare residents for potential extreme temperature events is public awareness. The issuance of advisories and extreme temperature preparedness tips assists residents on how to prepare for such events and what to do in case of medical emergencies related to extreme temperature events. Such public efforts would aid in minimizing potential injuries or deaths and minimizing the amount of property damage that may occur as a result of an extreme temperature event. Damage estimates associated

with historical extreme temperatures indicate a low probability for high-damage, high-injury events.

Extreme temperature hazard events are directly related to severe winter storms and drought events. Damage estimates provided for these hazards are related to potential damages that could result from an extreme temperature event. Damage to existing infrastructure is unlikely; damage to croplands in high temperature events and utility lines in low temperature events is more likely, plus a higher probability of death or injury during these temperature extremes.

6.11 Landslide Hazard Profile

6.11.1 Hazard Description

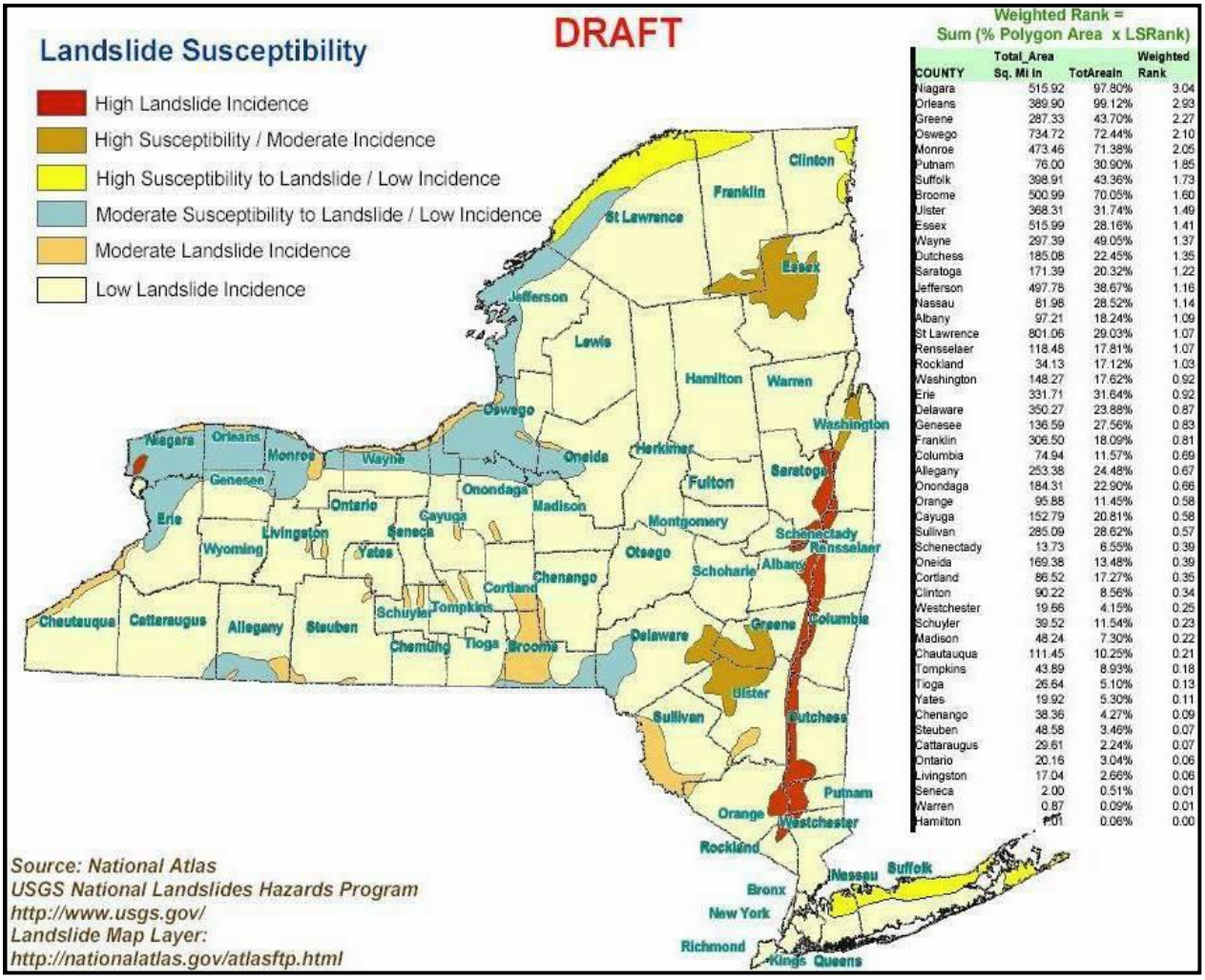
Landslides are defined as the downward and outward movement of slope-forming materials reacting to the force of gravity. Slide materials may be composed of natural rock, soil, artificial fill, or combinations of these materials. Landslide is a general term that can include rock falls, rockslides, creep, block glides, debris slides, earth-flow, and slump. During a landslide event, masses of rock, earth, or debris move down a slope. These events vary is speed of occurrence and how large of an area is impacted.

Landslides are activated by storms, earthquakes, volcanic eruptions, fires, alternate freezing or thawing, and steepening of slopes by erosion or human modification. Landslide problems can be caused by land mismanagement, especially in mountainous and coastal regions. In areas with high landslide potential, land-use zoning, professional inspections, and proper design can minimize many landslide, mudflow, and debris flow problems.

6.11.2 Geographic Location

Landslides have the potential to occur anywhere within Oswego County and to occur throughout a large region. There are no areas located within New York State that are documented as having an absence of landslide incidence. Figure 6.23 indicates the landslide susceptibility for New York State.

Figure 6.23 – Landslide Susceptibility within New York State
(USGS, NYS Hazard Mitigation Plan, 2007)



COUNTY	Total_Area Sq. Mi In	TotAreaIn	Weighted Rank
Niagara	515.92	97.80%	3.04
Orleans	389.90	99.12%	2.93
Greene	287.33	43.70%	2.27
Oswego	734.72	72.44%	2.10
Monroe	473.46	71.38%	2.05
Putnam	76.00	30.90%	1.85
Suffolk	398.91	43.36%	1.73
Broome	500.99	70.05%	1.60
Ulster	368.31	31.74%	1.49
Essex	515.99	28.16%	1.41
Wayne	297.39	49.05%	1.37
Dutchess	185.08	22.45%	1.35
Saratoga	171.39	20.32%	1.22
Jefferson	497.78	38.67%	1.16
Nassau	81.98	28.52%	1.14
Albany	97.21	18.24%	1.09
St Lawrence	801.06	29.03%	1.07
Rensselaer	118.48	17.81%	1.07
Rockland	34.13	17.12%	1.03
Washington	148.27	17.62%	0.92
Erie	331.71	31.64%	0.92
Delaware	350.27	23.88%	0.87
Genesee	136.59	27.56%	0.83
Franklin	306.50	18.09%	0.81
Columbia	74.94	11.57%	0.69
Allegany	253.38	24.48%	0.67
Onondaga	184.31	22.90%	0.66
Orange	95.88	11.45%	0.58
Cayuga	152.79	20.81%	0.58
Sullivan	285.09	28.62%	0.57
Schenectady	13.73	6.55%	0.39
Oneida	169.38	13.48%	0.39
Cortland	86.52	17.27%	0.35
Clinton	90.22	8.56%	0.34
Westchester	19.66	4.15%	0.25
Schuyler	39.52	11.54%	0.23
Madison	48.24	7.30%	0.22
Chautauqua	111.45	10.25%	0.21
Tompkins	43.89	8.93%	0.18
Tioga	26.64	5.10%	0.13
Yates	19.92	5.30%	0.11
Chenango	38.36	4.27%	0.09
Steuben	48.58	3.46%	0.07
Cattaraugus	29.61	2.24%	0.07
Ontario	20.16	3.04%	0.06
Livingston	17.04	2.66%	0.06
Seneca	2.00	0.51%	0.01
Warren	0.87	0.09%	0.01
Hamilton	0.01	0.06%	0.00

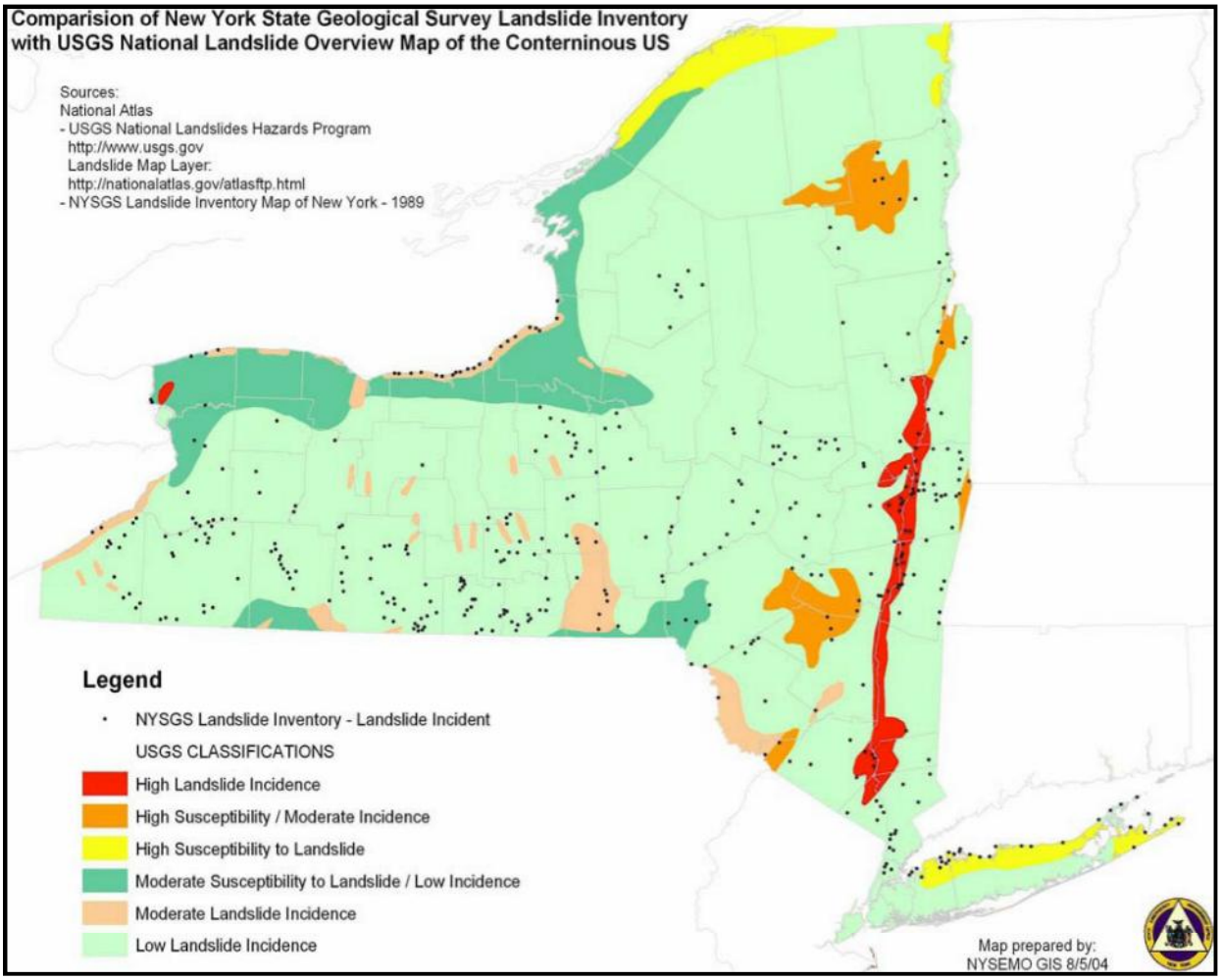
According to the above figure, the majority of Oswego County is classified as an area of moderate landslide susceptibility and low landslide incidence. Most of the Lake Ontario coastline within Oswego County is shown as an area of moderate landslide incidence as well, while the Tug Hill Region is depicted as an area of low landslide incidence. Approximately 80 percent of New York State is mapped as low landslide incidence, including the Tug Hill Region of Oswego County. The light blue and light orange portions of Oswego County are mapped as such due to their close proximity to the shore of Lake Ontario and/or their soil characteristics, which contain sand and fluvial materials that would not stand up well during a landslide event (NYSEMO, 2007).

6.11.3 Historical Occurrence

The New York State Hazard Mitigation Plan states that a total of 8 landslides have been reported in Oswego County between the years 1837 and 2007 (USGS, 2007). These 8 landslide events all occurred along the shoreline of Lake Ontario (Figure 6.24). Unfortunately, additional information pertaining to these eight (8) landslide events, such as specific location, dates, and damages, is not available and, therefore, cannot be included in this hazard profile.

Landslides in Oswego County are a rare event, and those that have occurred have impacted single structures or small areas. One such event is mentioned in the County's Hazard Analysis (2009). Several years ago, a minor landslide event occurred in the City of Fulton, along the bank of the Oswego River. A local hardware store was destroyed as a result of this event; no damage information was provided. No other landslide occurrences were included in the Oswego County Hazard Analysis.

Figure 6.24 – Landslide Incidence within New York State (NYSEMO, 2004)



6.11.4 County Vulnerability and Probability of Future Events

Landslides are a rare event in Oswego County, occurring less than once every 50 years. This occurrence estimate does not take into account small landslides confined to a limited area or single property. Numerous erosion events occur along the Lake Ontario shoreline every year, resulting in minor landslides. While these events often do not result in property damage, the potential for damage may increase with continued patterns of erosion.

The NYS Hazard Mitigation Plan ranks Oswego County in the top 15 Counties in the State as far as landslide susceptibility and vulnerability to landslide loss (NYSEMO, 2007). This ranking considered each County's landslide susceptibility factor, the number of documented historic landslide events, and the number of structures located within the County according to the HAZUS program.

During the hazard analysis for Oswego County, it was determined that landslides represent a moderately low hazard. This determination was made based on the frequency of historic occurrences and the minimal impact on populations, private property, and public facilities associated with these events. There is some potential for cascading effects to accompany a landslide event, such as a flood, if debris impacted the flow of water in an area, and structural collapse, if a landslide occurred immediately adjacent to structures or facilities.

6.11.5 Damage Estimate

Due to the lack of frequent historic landslide events, it is difficult to estimate the amount of damage that could realistically occur as a result of a landslide in Oswego County. Damage has not been reported in conjunction with minor landslides that occur as a result of erosion along the shoreline of Lake Ontario. Such events may decrease the size of or change the shape of a property, but do not typically cause damage to structures or facilities. A larger landslide event has the potential to damage up to 5% of the existing infrastructure and critical facilities around the edge of Lake Ontario. It is not anticipated that a more severe landslide event would affect a much larger land area. Most of the County's critical facilities are located farther from the Lake or are afforded extra protections, minimizing potential damages.

Landslide events in other parts of New York State have been documented to block water flow, creating potential flooding issues and property damage. Such an extreme landslide event could occur within Oswego County, especially within the Oswego River corridor, but the potential is low. Serious injury or death is unlikely to occur in Oswego County as a result of a landslide event.

6.12 Drought Hazard Profile

6.12.1 Hazard Description

A drought is defined as a prolonged period of limited precipitation affecting the supply and quality of water (HIRA-NY Definitions of Hazards). An absolute drought consists of a period of at least 15 consecutive days where none of the days experience 0.01 inches of rain or greater. A partial drought is a period of at least 20 consecutive days where the mean daily rainfall does not exceed 0.01 inches. A dry spell consists of a period of at least 15 consecutive days where none of the days experience 0.04 inches or more of rainfall (USGS, 2009).

Four type of drought are generally recognized by the climatological community (NOAA, NCDC, 2010):

1. ***Meteorological drought:*** occurs when dry weather patterns dominate the area;
2. ***Hydrological drought:*** occurs when low water supply becomes evident, especially in streams, reservoirs, and groundwater levels, usually after many months of meteorological drought;
3. ***Agricultural drought:*** occurs when crops become affected; and

4. ***Socioeconomic drought:*** relates the supply and demand of various commodities to drought.

Drought periods progress through stages and drought intensity may vary considerably during the drought period. The time of occurrence and duration of a drought event can cause significant variations in drought impacts (HIRA-NY Definitions of Hazards).

6.12.2 Geographic Location

A drought event would likely impact a large portion of Oswego County or the entire County. Droughts have the potential to occur in any region of New York State, at any time. New York State is not one of the most susceptible states in the U.S. regarding the occurrence of drought, but that does not mean that such an event could not occur within the State. The western and Midwestern U.S. tends to be the areas of the U.S. most susceptible to drought.

6.12.3 Historic Occurrence

Droughts with moderate to low impact in Oswego County have been an infrequent event, occurring between once every 8 years and once every 50 years. Historic drought conditions in Oswego County have typically resulted in impacts to the sources of private drinking water wells. A severe drought that would affect a regional water supply is less likely to occur. The National Climatic Data Center reports 5 records of drought events that have affected Oswego County. Details associated with these 5 records are included in Table 37.

Table 37 – Historic Drought Hazard Events for Oswego County, 1950-2010
(NOAA, NCDC, 2010)

Date	Event	Deaths (#)	Injuries (#)	Property Damage ($)	Crop Damage ($)
08/31/1993	Drought	0	0	0	$50M
09/01/1993	Drought	0	0	0	0
10/31/1993	Drought	0	0	0	0
11/01/1993	Drought	0	0	0	0
12/01/1993	Drought	0	0	0	0
Totals:		0	0	0	$50M

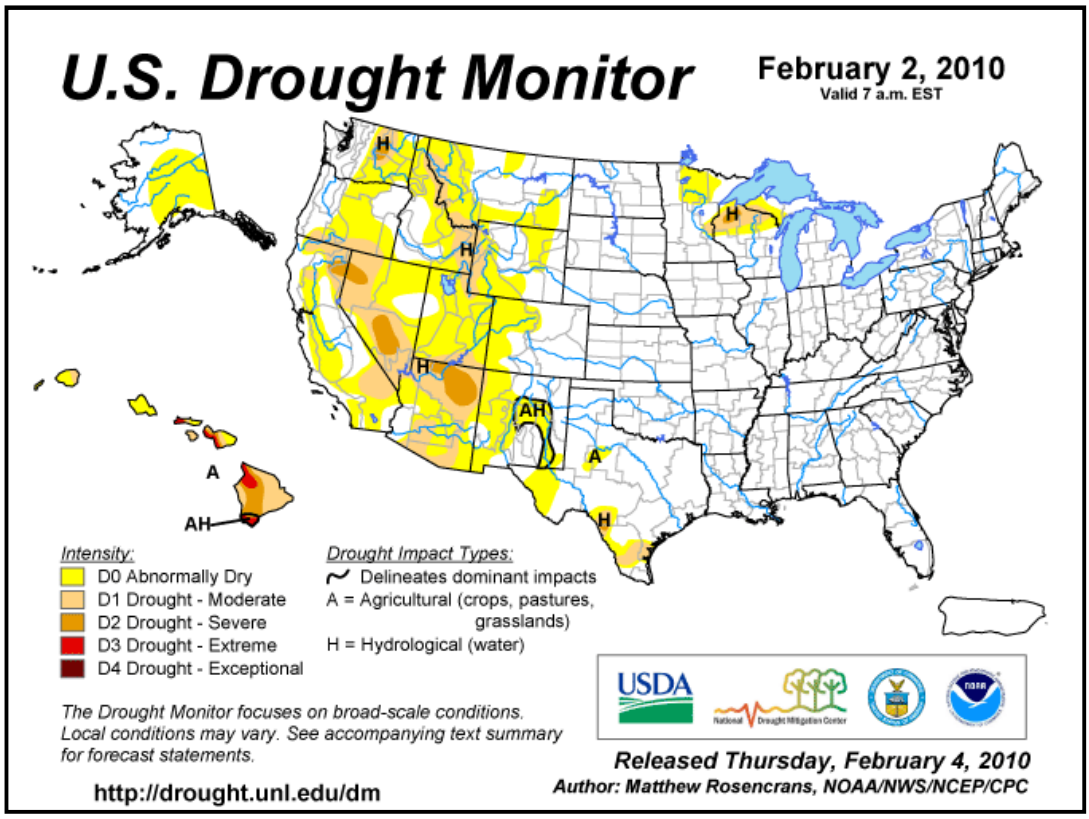
In each of the five records included in Table 37, Oswego County was listed as one of the multiple New York State counties that were included in drought-alert advisories issued by the New York State Drought Management Task Force in August 1993, September 1993, October 1993, November 1993, and December 1993. While Oswego County was included in the advisory, effects of the drought were not as severe as in other counties in the State.

6.12.4 County Vulnerability and Probability of Future Events

The probability of a future drought event that would have a low to moderate impact on the County is recognized as being an infrequent event. More severe drought events would be less probable. There is no history in Oswego County of a drought event causing emergency conditions.

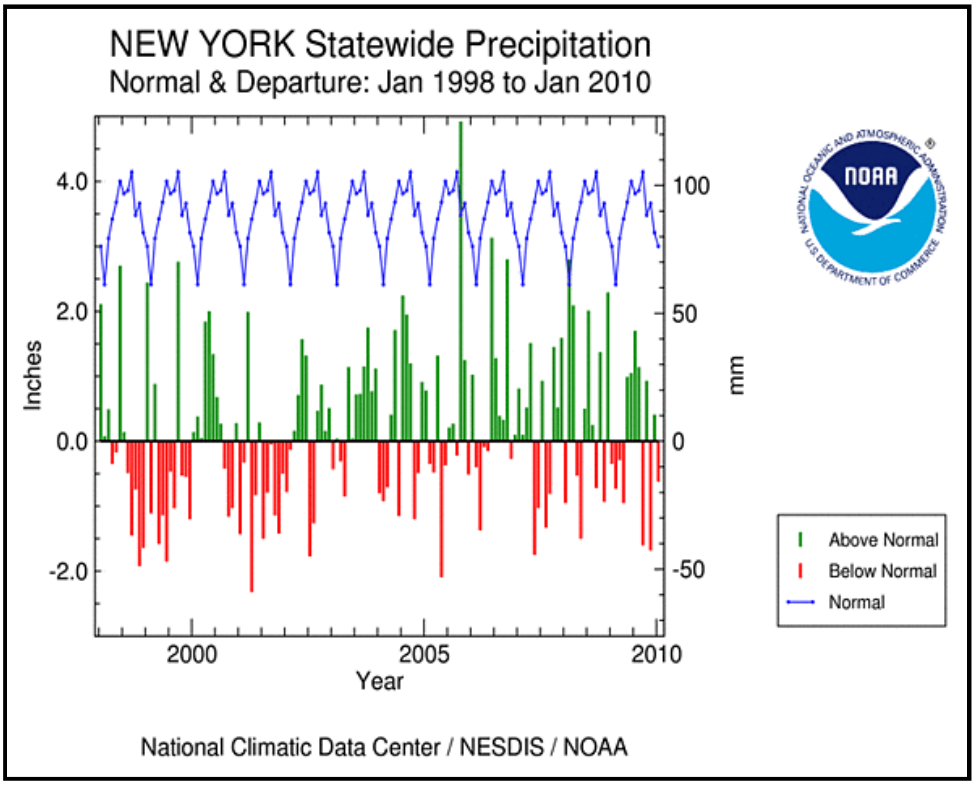
According to the USGS Drought Monitoring Program, data from February 2010 currently shows that New York State is near normal for total precipitation (Figure 6.25).

Figure 6.25 – U.S. Drought Monitor Map for February 2, 2010
(Rosencrans, NOAA, 2010)



A look at the precipitation rates from 1998 to 2010 in New York State also shows that, except for a few years, precipitation has been consistently normal throughout this time period (Figure 6.26). This normal precipitation pattern indicates a lack of drought-like conditions over the past two decades.

Figure 6.26 – New York State Precipitation Rates, 1998-2010
(NOAA, NCDC, 2010)



6.12.5 Damage Estimate

If a moderate drought were to occur, residents that are not part of a drinking water supply infrastructure and still obtain their water from a well would likely be those most affected. Many jurisdictions within Oswego County have started to plan Water Districts, but many others, particularly in the northern portion of the County, do not have public water supply infrastructure in place.

If a severe drought event were to occur, agricultural properties would likely experience the greatest impact. There is a total 817 parcels in the County that are denoted as agricultural, totaling $57,427,429 in value. The City of Fulton and the Town of Redfield have no classified agricultural properties within their jurisdictional limits. The jurisdictions that have the highest agricultural value are Town of Granby ($6,597,120),

Town/Village of Sandy Creek ($6,436,700), Town of Schroeppel ($6,178,900), and Town/Village of Mexico ($5,778,140). The jurisdictions that have the greatest amount of agricultural parcels are Town of Granby (101), Town/Village of Sandy Creek (96), Town of Schroeppel (84), and Town/Village of Hannibal (73). Approximately 9.6% of lands within Oswego County are associated with an agricultural land use. Jurisdictions with a high amount of agricultural property are the most vulnerable during a drought event and are the most likely to experience damages and impacts from such an event.

7.0 Technological and Human-Caused Hazards

7.1 Utility Failure Hazard Profile

7.1.1 Hazard Description

Utility failure includes the loss of electric and/or natural gas supply, telephone service, or public water supply as a result of an internal system failure and not by the effects of a natural disaster. A widespread electrical power outage could cause traffic accidents, civil unrest, and failures to other utility infrastructure that relies on electricity.

7.1.2 Geographic Location

This hazard could affect either a small area or a widespread area of the County.

7.1.3 Historic Occurrences

Oswego County was impacted by the power outage blackout of August 2003, which impacted much of the Northeast United States. Power was restored by the following day. This power outage event was declared a Presidential Disaster, authorizing up to $5 million in federal funding to reimburse local and state governments that were impacted by the occurrence. Additionally, a telecommunications outage for the Windstream territory around the City of Fulton affected telephone and related services for several hours on June 27, 2007. During severe storm events it is common for public utilities to be temporarily affected; however, there are no other records of extensive utility outages recorded for the County.

7.1.4 County Vulnerability and Probability of Future Events

Historical data indicates two minor utility failures during the past four years. Utility failure is documented as a regular event, estimating the occurrence of this hazard at between once a year and once every seven years. A worst-case scenario of a utility failure is highly likely to cause cascading effects. A prolonged outage could cause food and fuel shortages, water supply failures, and fires. Table 38 includes statistics reported by National Grid for Oswego County including total customers served and annual average number of power interruptions.

Table 38 – National Grid Power Outage Statistics for Oswego County, January 2005 – December 2008

Jurisdiction	Total Customers Served	Annual Avg # of Interruptions	Annual Avg Customers Interrupted	Annual Avg Customer Hours	Annual Avg Interruption Frequency per Customer	Annual Avg Outage Duration (hours)
(C) Fulton (includes Towns of Granby & Volney)	12,720	88	14,170	26,790	1.1	1.89
(C) Oswego (includes Towns of Oswego & Minetto)	12,481	89	18,639	37,214	1.5	2.00
(T) Albion & (V) Altmar	1,061	51	3,890	19,895	3.7	5.11
(T) Amboy	712	22	784	2,549	0.2	4.31
(T) Boylston	356	8	493	1,124	1.4	2.28
(T) Constantia & (V) Cleveland	2,709	97	10,413	30,646	3.8	2.94
(T) Granby	3,720	-	-	-	-	-
(T) Hannibal & (V) Hannibal	2,150	16	1,168	3,750	0.5	3.21
(T) Hastings & (V) Central Square	4,976	77	15,937	39,500	3.2	2.48
(T) Mexico & (V) Mexico	3,019	72	14,008	33,663	4.6	2.40
(T) Minetto	916	-	-	-	-	-
(T) New Haven	1,613	17	1,394	2,518	0.9	1.81
(T) Orwell	892	41	7,757	14,431	8.7	1.86
(T) Oswego	2,091	-	-	-	-	-

Table 38 – National Grid Power Outage Statistics for Oswego County, January 2005 – December 2008

Jurisdiction	Total Customers Served	Annual Avg # of Interruptions	Annual Avg Customers Interrupted	Annual Avg Customer Hours	Annual Avg Interruption Frequency per Customer	Annual Avg Outage Duration (hours)
(T) Palermo	1,623	17	1,028	3,465	0.6	3.37
(T) Parish & (V) Parish	1,241	42	5,292	14,223	4.3	2.69
(T) Redfield	614	35	1,358	5,162	2.2	3.80
(T) Richland & (V) Pulaski	3,562	58	13,019	24,655	3.7	1.89
(T) Sandy Creek, (V) Sandy Creek & (V) Lacona	3,109	52	10,690	36,401	3.4	3.41
(T) Schroeppel & (V) Phoenix	4,176	55	9,823	31,634	2.4	3.22
(T) Scriba	3,690	26	2,683	5,260	0.7	1.96
(T) Volney	2,974	-	-	-	-	-
(T) West Monroe	1,906	50	4,419	11,527	2.3	2.61
(T) Williamstown	737	35	2,126	21,895	2.9	10.30

Based on the data included in Table 38, the Town of Constantia and Village of Cleveland experience the most frequent annual number of power interruptions. Though these jurisdictions experience the most frequent interruptions, there are 8 jurisdictions which experience a higher annual average outage duration. Williamstown leads this category with an annual average power outage lasting 10.30 hours.

7.1.5 Damage Estimate

While the cascading effects of a utility failure could be devastating, recent history in Oswego County indicates that such events have been more of an inconvenience than a disaster. The frequent utility failure events that occur commonly result in no damage to private property or public infrastructure. A prolonged utility failure such as power outage could stress the County's emergency response and public response

agencies. Recent history indicates utility failures caused few issues to people or property.

7.2 Hazardous Materials (In Transit) Hazard Profile

7.2.1 Hazard Description

Hazardous materials (in transit) consists of an 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 (HIRA-NY, Definitions of Hazards).

7.2.2 Geographic Location

A hazardous materials in transit event could occur anywhere within the County but is more likely to occur along the following major transportation corridors: Interstate Route 81/US Route 11/CSX north-south rail line, State Route 481, US Route 104, the Oswego Canal (a section of the NYS Barge Canal System), and the Port of Oswego located on the shoreline of Lake Ontario.

7.2.3 Historic Occurrence

The Oswego County Hazardous Materials team has responded to a number of Response Level III incidents (according to the National Incident Management System incident ranking criteria) over the past several years. In November 2006, 28 cars and an engine of a CSX train derailed in the Village of Central Square, next to a major bridge on US Route 11. Four rail cars carried liquefied chlorine and two others were transporting liquid sodium hydroxide. While only a small amount of sodium hydroxide leaked, the potential for release during the retrieval of the tanks was high

and the County Hazmat Team, Fulton Fire Department Hazmat Team, Central Square Fire Department, and 14 other emergency response agencies (fire, law enforcement, emergency medical services, state and local emergency management) were on the scene for several days.

In March 2007, a stolen propane delivery truck crashed on a street in the Village of Pulaski, next to the Salmon River. While the propane tank remained intact during the accident, the potential for an explosion while it was recovered led to a voluntary evacuation of a two-mile radius, which took several hours as police and fire agencies went door-to-door to inform neighboring residents of the event.

7.2.4 County Vulnerability and Probability of Future Events

The hazardous materials teams in the County respond to several hazardous materials incidents a year. The potential for a large-scale hazmat in transit event is high on Interstate Route 81, State Route 481, and a primary CSX rail route that runs parallel to Interstate Route 81. Other potential locations where a hazardous materials incident is more probable include the County Airport in the Town of Volney and the Port Authority properties in the Town of Oswego.

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. While the majority of hazardous materials incidents in the County involve petroleum products, a significant number may involve extremely hazardous substances. The release of an extremely hazardous substance could cause widespread injury or death in the area in which it is released.

The probability of future hazardous materials in transit events within Oswego County is moderately high and was determined to be a regular event, occurring between once a year and once every seven years. Response Level III incidents occur in the County on a regular basis (between once a year and once every seven years). There is some potential for cascading effects from a hazmat-in-transit event, depending upon the nature of the incident. Cascading hazards could include explosion, fire, hazmat (fixed site), oil spill, structural collapse, transportation accident, utility failure, and water supply contamination.

7.2.5 Damage Estimate

Recent events have not resulted in death or injury and have only involved fairly minor levels of property damage. A large-scale hazmat event has the potential to carry with it a long recovery period, a large amount of damage, and a high damage cost estimates. The greatest cost associated with previous hazmat events in Oswego County has been personnel time spent cleaning up the incident site.

7.3 Terrorism Hazard Profile

7.3.1 Hazard Description

Terrorism is defined as the threat or use of violence to achieve political or social ends usually associated with community disruption and/or multiple injuries or deaths (HIRA-NY, Definitions of Hazards).

7.3.2 Geographic Location

A terrorism event could occur anywhere in the County, but is more likely at one of the critical facilities identified within the County. Locations

of schools, colleges, power generating stations, and transportation centers are likely areas of highest risk for such an event.

7.3.3 Historic Occurrences

Terrorism events specific to Oswego County consist of bomb threats at multiple schools in recent history. While these events caused no serious injuries, they did disrupt the schools and presented a hazardous situation for emergency services and personnel. The only act of terrorism in recent years that was declared a presidential disaster was the attacks on September 11, 2001. The disaster declaration for this terrorist attack included all Counties within New York State.

7.3.4 County Vulnerability and Probability of Future Events

The participating jurisdictions and agencies determined that terrorism is an infrequent event that occurs between once every eight years and once every 50 years. The severity of a terrorist attack would likely be high, especially related to the number of injuries that may occur.

The group determined that there is some potential to experience cascading effects as well, depending on the exact details of the terrorism event. Possible cascading effects include civil unrest, dam failure, epidemic, explosion, fire, flood, fuel shortage, hazmat (fixed site), hazmat (in transit), oil spill, radiological (fixed site), radiological (in transit), structural collapse, transportation accident, utility failure, water supply contamination, and wildfire.

7.3.5 Damage Estimate

Although the severity of a terrorism event would be high, the damage to private property would likely be low. Damage to critical facilities has the potential to be high or moderate, depending on the location and specifics of the incident. Currently, the Department of Homeland Security is bolstering law enforcement and emergency response agencies' abilities to respond to and prevent future terrorist attacks. This Country-wide watch on terrorist activity helps areas like Oswego County maintain a low probability status associated with large terrorist events.

7.4 Dam Failure Hazard Profile

7.4.1 Hazard Description

Dam failure is identified as dam structural deterioration, either gradual or sudden, that results in the inability to control impounded water as designed. This deterioration poses a danger to people and/or property in the potential inundation area.

Dam failure can occur with little warning. Intense storms may produce a flood in a few hours or even minutes for upstream locations. Flash floods occur within six hours of the beginning of heavy rainfall, and dam failure may occur within hours of the first signs of breaching.

Dams may be either man-made or exist because of natural phenomena, such as landslides or glacial deposits. The majority of dams are man-made structures normally constructed of earth or concrete. There are 107 dams located within Oswego County, of which many are small and do not constitute a serious threat to the downstream area if they were to fail.

Dam failure can result from many factors such as natural disasters, structural deterioration, or actions caused by man, including terrorism. For concrete dams, the major reason for failure is associated with foundations. For earthen dams, piping was the main reason for failure. Over topping affects both concrete and earthen dams which do not have adequate spillways to allow for high water levels to pass through without damaging the structure (HIRA-NY, Definitions of Hazards).

7.4.2 Geographic Location

As indicated, the NYSDEC lists 107 locations of dams within Oswego County. The majority of these dams are on private property with a low downstream potential hazard. The larger dams with the highest downstream risk in Oswego County are located on the Salmon and Oswego Rivers next to hydroelectric stations, most of which are operated by Brookfield Renewable Power. Emergency plans are in place with early notification to municipal and emergency response officials in the event of an emergency situation.

7.4.3 Historic Occurrences

The NYSDEC lists seven dams in Oswego County as having a high downstream hazard (hazard code C) in the event of a failure. All seven of these dams are located along the Salmon and Oswego Rivers. These high hazard dams are recorded as follows:

- Salmon River Hydroelectric Project: Bennetts Bridge Development and Lighthouse Hill Development – Brookfield Renewable Power hydroelectric power generating stations;

- Oswego Project: Oswego Falls East and Oswego Falls West in Fulton, Minetto, and Oswego – Brookfield Renewable Power hydroelectric power generation station; and
- Phoenix Dam: Algonquin Power hydroelectric power generating station.

Another 10 dams are listed as having an intermediate downstream hazard potential (hazard code B) are located within Oswego County. These intermediate hazard dams include:

- Pulaski dam;
- Cedar Lake dam in Orwell;
- Kasaog Lake dam in Williamstown;
- Mallory dam in Hastings;
- Hatchery dam in Constantia;
- Caughdenoy dam in Hastings/Clay (the downstream impacts would occur in Schroeppel);
- Sharps Pond dam in Fulton/Volney;
- Upper Fulton dam, Lock 2, in Granby/Volney; and
- Hannibal dam.

The remaining 90 dam locations in Oswego County are classified as having low downstream hazard potential (hazard class A). Minor dam failures have occurred within the County associated with beaver dam failures or failures of earthen dams. These events have occurred in unpopulated areas with low hazard potential dams resulting in no listed damages.

7.4.4 County Vulnerability and Probability of Future Events

Dam failure was documented as a rare event within Oswego County. Cascading effects would be highly likely in the event of a dam failure. These additional effects may include flood, hazmat (fixed site), oil spill, structural collapse, utility failure, and water supply contamination. During the hazard analysis for Oswego County it was determined that the safety system and early warning systems of the Class A dams along the Salmon and Oswego Rivers make them a lesser risk. The smaller Class B and Class C dams pose a greater risk but have less potential for failure.

7.4.5 Damage Estimate

While several dams are located on the Oswego and Salmon Rivers as part of hydroelectric projects, the safety features of those dams lowers the risk of failure. It was noted during the County's hazard assessment that there is greater concern of damage from the failure of beaver dams. Beaver dams have the potential to restrict large flows that could result in large impacts to downstream locations. Sites of hazardous beaver dams are often unknown and hard to locate until a failure occurs. Since no damage has been noted in Oswego County as a result of a dam failure event, it is difficult to estimate potential damages that could occur.

7.5 Fire Hazard Profile

7.5.1 Hazard Description

Fire is defined as the uncontrolled burning in residential, commercial, industrial, institutional, or other structures in developed areas. It is important to note the fire spreads quickly. Heat and smoke from fire can be more dangerous than the flames themselves. Inhaling the super-hot air can sear a person's lungs. Fire produces poisonous gases that

make a person disoriented and drowsy. Asphyxiation is the leading cause of fire deaths (HIRA-NY, Definitions of Hazards).

7.5.2 Geographic Location

Fires could occur in the two cities and any of the Villages in residential, commercials, or industrial areas.

7.5.3 Historic Occurrences

A block fire in the Village of Mexico destroyed several historic buildings. No date is recorded for this event. A block fire also occurred in the City of Oswego destroyed a commercial area and left a number of individuals homeless. No date is noted for this fire incident either.

Industrial fires have occurred in vacant properties, such as the former Hammerhill plant in Oswego and the former Miller Brewery in the City of Fulton. Both fires were contained, although they impacted the resources of the fire service in the County during the incidents.

Other minor fires and fires contained to a single structure occur often within the County but are not detailed here due to their size and limited damage.

7.5.4 County Vulnerability and Probability of Future Events

It was determined during the County's hazard assessment that fires are a frequent event, occurring between once a year and once every seven years. The potential for cascading effects was also noted, including explosion, hazmat (fixed site), structural collapse, and utility failure. It was noted that the nature of a fire to affect a smaller area would have little impact on the rest of the County, beyond the use of fire and emergency

response resources to control such an event. Block fires are the biggest concern associated with a fire hazard.

7.5.5 Damage Estimate

Fire was classified as a frequent event that commonly affects a small area and is confined to a single structure or location. These details indicate the a relatively low amount of damage, though higher damaging block fires are possible within Oswego County. Larger fire events would create an increased amount of damage, particularly if such an event were to occur within the City of Fulton or Oswego where the areas are more densely populated.

7.6 Epidemic Hazard Profile

7.6.1 Hazard Description

An epidemic is the occurrence or outbreak of disease to an unusual number of individuals or proportion of the population, human or animal.

7.6.2 Geographic Location

An epidemic would likely affect the entire County or a large region of the County.

7.6.3 Historic Occurrence

The H1N1 flu virus is a current epidemic that began to affect Oswego County in 2009. This epidemic event has not reached the damaging proportions that were initially projected, both in the County and in the United States. This recent epidemic incident has added more

potential to this hazard event. No epidemics in Oswego County history have caused emergency conditions.

7.6.4 County Vulnerability and Probability of Future Events

An epidemic could include flu (bird flu, H1N1 virus), eastern equine encephalitis (EEE), and West Nile virus. The impact on people could be economic, due to the inability of an infected person to go to work. An epidemic event also poses an impact on public health. Such an event has the potential to cause serious injury or death to large numbers of people, and would cause moderate damage to private property and little or no structural damage to public facilities.

During Oswego County's hazard analysis it was determined that epidemics are an infrequent event, which is detailed as once every eight years and once every 50 years. In a worst case scenario, cascading effects could include civil unrest, food shortage, fuel shortage, transportation accident, or utility failure due to large numbers of people unable to provide services.

7.6.5 Damage Estimate

Being that there are no documented epidemic hazard events that have occurred in Oswego County in recent history, it is difficult to estimate potential damages due to such an event. A severe epidemic has a large potential to cause multiple deaths and create economic hardships for numerous residents. An epidemic event would likely cause the most damage in the City of Fulton, City of Oswego, or SUNY Oswego and Cayuga Community College campuses, where a large amount of people frequent a small area of the County.

7.7 Hazardous Materials (Fixed Site) Hazard Profile

7.7.1 Hazard Description

Hazardous materials (fixed site) consists of consists of an 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 environmental through the material's flammability, toxicity, corrosiveness, chemical instability and/or combustibility.

7.7.2 Geographic Location

Individual facilities housing hazardous materials are located throughout the County. A higher frequency of hazmat sites is located in the Cities of Oswego and Fulton.

7.7.3 Historic Occurrences

Hazardous materials incidents have occurred at several industries in recent history; however, none have resulted in large, damaging incidents and remained mostly contained at the facility sites. No specific incidents were reported or detailed within Oswego County's Hazard Analysis.

7.7.4 County Vulnerability and Probability of Future Events

A hazardous materials accident at a fixed site in Oswego County is possible. The County has 77 facilities that report having Extremely Hazardous Substances (EHS) under the federal SARA Title III. The Tier II reports for these facilities are on file through the Oswego County Local Emergency Planning Committee at the Oswego County Emergency Management Office. These sites have emergency plans in place in case

such a hazard event should arise. The larger facilities conduct training activities with the Oswego County Hazardous Materials Team and other response agencies during drills and exercises. A hazmat incident at one of these noted facilities could cause an evacuation. It was determined that a fixed site incident could cause serious injury or death but not in large numbers. The facility itself would be damaged, but there would be little or no damage to private property or public facilities.

Hazardous materials events that occur at a fixed site were analyzed as a regular event, occurring between once a year and once every seven years. During the Oswego County hazard analysis, it was determined that hazmat incidents occur often, but are often contained by the responding fire department(s) and hazardous materials team resulting in no damage to adjacent property and not deaths or serious injury. There is also some potential for cascading effects, which could include explosion, fire, oil spill, structural collapse, or water supply contamination, depending upon the details of the incident.

7.7.5 Damage Estimate

The safety and emergency response procedures in place at the facilities that house hazardous materials, and the availability and expertise of special operations teams to handle hazmat incidents, lowers the County's vulnerability to hazmat incidents. Having this safety network in place limits the amount of damage that occurs within Oswego County in association with hazmat – fixed site hazard events.

7.8 Radiological (Fixed Site) Hazard Profile

7.8.1 Hazard Description

A radiological fixed site event is detailed as a release or threat of release of radioactive material from a nuclear power generating station or research reactor or other stationary source of radioactivity. Commercial nuclear power generating facilities have the greatest concentration of radioactive materials of any private source (HIRA-NY, Definitions of Hazards).

7.8.2 Geographic Location

The area affected by life-threatening effects of a nuclear power plant incident would be well within a 10-mile radius. Oswego County has established a 10-mile Emergency Preparedness Zone around the three nuclear power generating sites located within Oswego County and have concentrated public notification and planning efforts in that area.

7.8.3 Historic Occurrences

Oswego County is home to three nuclear power plants located in the Town of Scriba – Nine Mile Point Nuclear Station Units 1 and 2 and the James A. FitzPatrick Plant. The construction and safety features of the plants, regulated by the Nuclear Regulatory Commission, help to keep the possibility of an incident that affects the health and safety of the public very low. In addition, notification systems to government and emergency response agencies as well as the general public are in place and tested regularly, as are emergency response plans.

The three plants in Oswego County have never had an incident that has resulted in harm to any member of the public. These plants continue

to operate under stringent safety regulations. Oswego County has developed the Oswego County Radiological Emergency Preparedness Plan to respond to nuclear power plant emergencies. The County reviews, revises, and exercises this preparedness plan on an annual basis with representatives of the nuclear industry and New York State.

While the nuclear power plants have had to consult their emergency plan for several emergencies during their 20-plus year operation life, none of the emergencies have caused any threat to public health and safety.

7.8.4 County Vulnerability and Probability of Future Events

A nuclear power plant accident causing harm to the public health and safety is documented as a rare event, meaning that it is estimated to occur less than once every 50 years. Oswego County's hazard analysis determined that the County's vulnerability to a nuclear power plant accident is low.

There is some potential for cascading effects from a nuclear power plant accident. Potential cascading effects include air contamination, civil unrest, and transportation accident. Serious injury or death from a nuclear power plant incident would be well within the established 10-mile radius.

7.8.5 Damage Estimate

No details are available regarding previous emergency events that have occurred at the nuclear power plant sites in Oswego County. These events did not compromise public health or safety and did not create any public property or critical facility damage. A radiological – fixed site event has a low probably of occurrence within Oswego County.

8.0 Hazard Mitigation

8.1 Mitigation Planning Approach

In order for Oswego County and participating jurisdictions to be eligible for FEMA mitigation funding, the content of the mitigation plan must meet planning requirements in 44 CFR Part 201. This regulation states that the plan should include:

- Goals aimed at reducing or avoiding losses from the indentified hazards;
- Mitigation actions that will help accomplish the established goals;
- Strategies that detail how the mitigation actions will be implemented and administered; and
- Description of how and when the plan will be updated.

This content is included and detailed by the planning approach established in *Developing the Mitigation Plan: identifying mitigation actions and implementing strategies* (FEMA 386-3, 2003). This approach was used to guide the formulation of goals and objectives and prepare associated mitigation strategies for Oswego County's hazard mitigation plan. FEMA's guide detailed a four step approach to complete the mitigation process:

1. *Develop Mitigation Goals and Objectives:* Mitigation goals and objectives were developed by the Northern, Central, and Southern Working Groups using information from the hazard profiles, loss estimation findings, critical facilities mapping, County and jurisdictional vulnerabilities, existing regulations, reviews, and documents related to hazard events, and the County and jurisdictional hazard analyses. These goals are recognized as

general guidelines, detailing what the participating jurisdictions hope to achieve as a result of this process.

2. *Identify and Prioritize Mitigation Actions:* Through the identification and prioritization of mitigation actions, a list of projects to reduce future hazard vulnerabilities was formed. This list of mitigation strategies/actions was identified by the working groups in order to complete the mitigation goals and objectives that were identified during the County mitigation planning process.

3. *Prepare an Implementation Strategy:* For each mitigation action, a responsible agency or organization, and a potential funding source, and realistic time frame for completing each project were identified. An implementation strategy helps to identify the resources and steps necessary to execute mitigation projects.

4. *Document the Mitigation Planning Process:* Documentation and details of all steps completed throughout the mitigation planning process are recorded in the County's hazard mitigation plan.

8.2 Goals and Objectives

Oswego County and participating jurisdiction representatives developed the following goals and strategies based on the risk assessment results, County vulnerabilities, and County and jurisdictional capabilities. Goals are general guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term, and represent global visions (FEMA 386-3, 2003). The goals and objectives identified by this process represent what the participants were hoping to achieve through the implementation of this hazard mitigation plan. Specific mitigation strategies were identified that support the goals and objectives of this plan. These strategies were adjusted as a result of hazard research, working group member input, Oswego County personnel input, and comments received during the three public meetings hosted during the mitigation planning process.

Each identified goal includes a list of associated objectives that further delineate the specific strategies or implementation steps associated with that goal. Unlike goals, objectives are specific and measurable (FEMA, 386-3, 2003). The objectives were based on generally grouping common mitigation strategy themes that were identified during working group meetings and County representative meetings. All goals identified as a result of the risk assessment process are compatible with the goals of Oswego County, as identified in the County's Comprehensive Plan.

The five mitigation goals and their associated objectives are detailed as follows:

Goal 1: Increase Community Education and Disaster Preparedness

Objectives:

a. Educate Town/Village Boards and Officials on implementation of new codes or project reviews
b. Educate public on how to prevent impacts from hazard events
c. Educate public how to prepare for hazard events and the course of action to follow if hazards occur
d. Alert community of emergency shelter locations and procedures in case of an emergency – establish shelter locations if necessary

Goal 2: Encourage Partnerships and Mutual Aid Agreements

Objectives:

a. Create a County and municipal equipment inventory and establish guidelines for its use (intra- and inter-municipal)
b. Foster inter-municipal awareness of and participation during emergency and hazard events
c. Implement mutual aid agreements with specialty groups for hazard events

Goal 3: Provide for Public Health and Safety

Objectives:

a. Review existing County/Town/Village codes, setbacks, and review processes
b. Reduce power outages using preventative measures
c. Decrease the time it takes to clear roads and waterways of debris, especially following hazard events
d. Inventory emergency response equipment

Goal 4: Protect the Environment, Private Property, and Community Facilities

Objectives:

a. Review existing County/Town/Village codes, setbacks, and review processes
b. Enforce/promote smart development within the County
c. Security readiness and emergency response plans should be reviewed at public water supplies and sewer facilities – review potential/feasibility for water supply extensions
d. Evaluate opportunities to decrease flooding problems within the County and decrease property impacts
e. Maintain critical facilities within Oswego County

Goal 5: Improve County-wide Communication Systems and Transportation Infrastructure

Objectives:

a. Ensure all emergency response personnel are trained to respond and handle hazard events
b. Establish database and procedure to notify affected individuals – particularly elderly and special needs – in the event of an emergency

c. Improve public communications systems in the County
d. Identify critical facilities and emergency shelter locations that should have backup power generation capabilities for emergencies
e. Review and publish response plan protocols
f. Improve/maintain deficient transportation infrastructure

8.3 Mitigation Actions

Several mitigation actions were proposed by Oswego County and other participating jurisdictions in order to reduce the impact of potential hazard events. The implementation of these specific mitigation actions would aid in achieving the goals and objectives listed in Section 8.2. The proposed mitigation actions are varied, but can be grouped into six broad categories as indicated by FEMA 386-3:

- **Prevention** – Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital government programs, open space preservation, and storm water management regulations.
- **Property Protection** – Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness** – Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- **Natural Resource Protection** – Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services** – Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- **Structural Projects** – Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

Table 39 lists all the mitigation actions that were proposed by Oswego County personnel, working group representatives, or members of the public. The natural, technological, or human caused hazards that would be mitigated by each proposed action are also noted in the Table. Some actions relate to a specific hazard event, while others may be implemented to mitigate the impacts of multiple hazards. All proposed actions were reviewed by the working group participants to ensure that they meet the goals and objectives stated in this plan. The proposed Oswego County mitigation actions represent a sufficient range of projects that are well distributed throughout the six categories of mitigation (prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects). Some of the proposed actions included in this plan represent maintenance actions; such activities normally are not representative of mitigation actions and are generally not eligible for funding under FEMA's Hazard Mitigation Assistance Program.

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
All Participating Jurisdictions – County and All Municipalities																				
Promote sprinkler installation in housing by revising building codes																	X			
Implement/revise review board regulations and building/zoning codes	X	X	X	X	X		X						X				X			
Increase public awareness and education programs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Offer zoning training programs at local/County level	X	X	X	X	X		X						X				X			
Educate public how to prepare for hazard events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Provide training to emergency response personnel to handle hazard events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Identify emergency shelter locations, establish if necessary –	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inventory emergency shelters and critical facilities that need generators – supply generated power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine supplies and volunteers needed at emergency shelters during hazard events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Establish animal evacuation protocols and animal shelter locations for emergency events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Database of resources and locations of equipment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Establish guidelines for inter- and intra-municipal use of equipment during emergencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Review resources available for road closings	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X		X	X
Improve inter-municipal communications and awareness during hazard events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Secure additional equipment needed to combat hazard events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Review existing Village/Town/County codes, setbacks, and review processes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Establish preventative municipal tree removal programs													X							
Provide appropriate tree planting lists to residents – education programs													X							
Establish a road watch program during hazard events	X	X	X	X	X	X	X				X		X	X						
Determine whether additional code enforcement officers are needed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Enforce/promote smart development within communities	X	X	X	X	X		X		X		X		X				X			
Maintain stormwater systems, including roadside drainages and culverts					X															
Review security and hazard preparedness at water supply and sewer facilities within County															X					
Enhance security measures and implement response plans at water supply and sewer facilities within County															X					

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Determine feasibility/potential to extend existing public water supply and sewer services						X				X		X					X			
Provide for the flood-proofing of homes located within floodplains					X															
Establish programs and funds to purchase houses located within floodplains or with frequent flooding issues					X															
Review and update spill response plan protocol (land and water) and equipment availability and options														X					X	X
Offer fire prevention education to community						X											X			
Implement land use plans					X														X	X
Establish protocol for post-event assessments to determine extent of help required in community	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Oswego County																				
Alert community of locations of shelters and procedures during emergency events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Enhance current tree removal program executed by National Grid													X							
Review/implement County regulations and insurance regulations to construct in floodplains – enforce/promote smart development					X															
Provide training on NY Alert system	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Review current agreement for County to access/service private roads – enhance as needed	X	X			X	X	X													
Inform private road residents of current access/service agreement within County	X	X			X	X	X													
Provide maintenance for historic lighthouse in Oswego – re-enforce break wall	X				X															
Coordinate with NYS Flood Mitigation Group regarding flooding issue within Oswego County					x															
Coordinate with US Army Corps regarding ways to reduce Oneida Lake flooding issues affected by Barge Canal system					X															
Educate public on Hyper-reach capabilities and uses	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inventory County and municipal equipment availability	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Continue work to increase availability of broadband throughout County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Continue to inventory aging transportation infrastructure within County		X			X			X						X						
Coordinate with NYS Thruway regarding ways to distribute hazard event information to Thruway travelers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Review response plan of communities located within Hancock flight paths – revise as needed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Continue EEE spraying program in County as needed – evaluate program effectiveness on annual basis																		X		
Implement aid and liability agreements with local ATV clubs to assist during emergencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implement aid and liability agreements with local HAM operators to assist during emergencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Add additional emergency response trailers along I-81 corridor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Improve cell phone reception and GPS function within County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Develop database of special needs and elderly individuals within County and a system to contact them in case of emergency – update database annually	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Town of Albion																				
Implement response protocols to remove ice jams from waterways								X												
Implement response protocols to remove debris jams from waterways					X															
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Village of Altmar																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Town of Amboy																				
Town of Boylston																				
Village of Central Square																				
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Village of Cleveland																				
Establish breakwall on Oneida Lake for safety on waterway	X								X											
Examine and implement ways to reduce flooding issues on north shore of Oneida Lake					X															
Purchase anti-icing equipment for Village vehicles (especially plows)	X	X					X													
Acquire/install dry hydrants in populated areas for fire suppression						X											X			

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Pre/post hazard awareness and preparedness information on Village website	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Purchase portable radios for volunteer and aid worker use to coordinate disaster relief efforts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Complete flooding/ drainage analysis to reduce flood impacts to properties along north shore of Oneida Lake	X				X			X												
Town of Constantia																				
Examine and implement ways to reduce flooding issues on north shore of Oneida Lake					X															
Complete flooding/ drainage analysis to reduce flood impacts to properties along north shore of Oneida Lake	X				X			X												
City of Fulton																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Bank stabilization along Oswego Canal, near Indian Point Trail	X				X															
Town of Granby																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Clean out brush to prevent flooding at Sheldon, Lay, and Tannery Creeks	X				X		X	X												
Village of Hannibal																				
Conduct a comprehensive engineering assessment of the dam in Hannibal					X															
Town of Hannibal																				
Conduct a comprehensive engineering assessment of the dam in Hannibal					X															
Town of Hastings																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Examine and implement ways to reduce flooding issues on north shore of Oneida Lake					X															
Complete flooding/ drainage analysis to reduce flood impacts to properties along north shore of Oneida Lake	X				X			X												
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Village of Lacona																				
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Install security gate and fencing around water storage tank and JWW															X			X		
Village of Mexico																				
Enforce zoning regulations (especially propane warehouse)																			X	
Town of Mexico																				
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Increase building setbacks along Lake Ontario to reduce erosion potential and impacts	X										X									
Enforce zoning regulations (especially propane warehouse)																			X	
Replace Mungeu Hill Road Bridge														X			X			
Town of New Haven																				
Increase building setbacks along Lake Ontario to reduce erosion potential and impacts	X										X									
Town of Orwell																				
Install security fencing around public water supply															X			X		
Join the NFIP	X				X															

Table 39 – County and Shared Proposed Hazard Mitigation Actions

Mitigation Actions	Natural Hazards												Technological/Human-Caused Hazards							
	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
City of Oswego																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Review w/ SUNY Oswego their response plan protocol regarding acts of terrorism, sporting events, and an epidemic event – update annually															X			X		
Increase building setbacks along Lake Ontario to reduce erosion potential and impacts	X										X									
Town of Oswego																				
Increase building setbacks along Lake Ontario to reduce erosion potential and impacts	X										X									
Establish snow drift caution signage along NYS Route 104 – coordinate with NYS DOT							X													
Village of Parish																				
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Town of Parish																				
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Village of Pulaski																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Repair/replace retaining wall between private properties and Salmon River					X						X									
Purchase new radios for 911 system	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Install security fencing around public water supply wells and water tank															X			X		
Town of Redfield																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Tree removal CR 39, CR 27, Ryan Rd, Hayes Dr, Jess Dr, Teachout Rd	X	X					X						X							

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Upgrade culverts/bridges: Ryan Rd, Yerdon Dr, Harvester Mill Rd, Littlejohn Dr, Abe's Dr, Castor Dr, Fox Rd, CR 17, Waterbury Rd	X				X		X	X												
Town of Richland																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Increase building setbacks along Lake Ontario to reduce erosion potential and impacts	X										X									
Establish snow drift caution signage along NYS Route 104 – coordinate with NYS DOT							X													
Purchase new radios for 911 system	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Village of Sandy Creek																				
Install security alarm for chlorination building, filtration plant, and pump house															X					
Improve stormwater drainage along Route 11 (between Park St. and Harwood Ave.) and Lake Road (between post office and Harwood Ave.)	X				X		X		X											

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Town of Sandy Creek																				
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Increase building setbacks along Lake Ontario to reduce erosion potential and impacts	X										X									
Pre/post hazard awareness and preparedness information on Town website	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Purchase portable radios for volunteer and aid worker use to coordinate disaster relief efforts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Acquire/install dry hydrants in populated areas for fire suppression						X											X			
Purchase anti-icing equipment for Town vehicles (especially plows)	X	X					X													
Upgrade culverts at Norton, Snyder, Henderson, Tryon Roads	X				X		X	X												

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Town of Scriba																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Increase building setbacks along Lake Ontario to reduce erosion potential and impacts	X										X									
Town of Volney																				
Implement response protocols to remove debris jams from waterways					X															
Implement response protocols to remove ice jams from waterways								X												
Town of West Monroe																				
Examine and implement ways to reduce flooding issues on north shore of Oneida Lake					X															
Complete flooding/ drainage analysis to reduce flood impacts to properties along north shore of Oneida Lake	X				X			X												
Increase amount of automatic message boards along Interstate 81	X	X			X		X		X											
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	X	X	X	X	X	X	X		X		X			X	X					
Install programmable emergency message sign and backup generator at Town of West Monroe Town Hall	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 39 – County and Shared Proposed Hazard Mitigation Actions

	Natural Hazards												Technological/Human-Caused Hazards							
Mitigation Actions	Severe Storm	Ice Storm	Earthquake	Tornado	Flood	Wildfire	Winter Storm (severe)	Ice Jam	Coastal Storm	Extreme Temperatures	Landslide	Drought	Utility Failure	Hazmat (in transit)	Terrorism	Dam Failure	Fire	Epidemic	Hazmat (fixed site)	Radiological (fixed site)
Town of Williamstown																				
Improve public education and awareness – possibly through creation of a Public Information Official position	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Join the NFIP	X				X															

The complete list of proposed mitigation actions were compiled based on a need, as noted by members of the County, working groups, or public. The proposed actions were chosen based on their effectiveness in accomplishing one or more of the goals established as part of this hazard mitigation plan. Once these actions were suggested, they were analyzed to determine their feasibility, cost, and implementation timelines. A mitigation action table detailing the specific hazards mitigated, goals and objectives achieved, implementing agency(ies), estimated costs, potential funding sources, and implementation timeframes is provided as Appendix F. It is also important to note that the information included in Appendix F specifies whether each mitigation action will apply to new and/or existing developments/infrastructure.

8.4 Mitigation Strategy Implementation

The approximate costs considered for each mitigation action were determined based on estimated price ranges. The levels for the cost estimates are as follows:

- Low: cost is estimated to be below $10,000.00
- Medium: cost is estimated to be between $10,000.00 and $100,000.00
- High: cost is estimated to be over $100,000.00

The implementation timeframes provided for each mitigation action are also estimated. The levels for the timeframe estimates for each mitigation action are as follows:

- Short: short-term, completion anticipated within 1-2 years
- Moderate: completion anticipated within 5 years
- Long: long-term, completion anticipated in greater than 5 years

For some mitigation actions the timeframe is presented as a range. This indicates that the action is currently being implemented or should be implemented as soon as possible and that it will continue throughout the life of the current mitigation plan. Often, long-term actions require updates, annual reviews, or extensive coordination and/or implementation that may take longer than five (5) years to complete. Similar to Table 39, Appendix F separates the proposed pre-disaster mitigation actions by associated jurisdiction(s).

8.5 Mitigation Prioritization

The mitigation actions proposed as part of the hazard mitigation process for Oswego County were submitted by members of the public, County personnel, municipal representatives, and representatives of other participating agencies and groups. General priority measures were instituted in order to prioritize the proposed mitigation actions that are included as part of this plan. It is important to note that the recognized priority levels are based on the current knowledge of the mitigation actions, including their estimated costs, timeframes, and funding availability. Prioritization criteria will be reviewed and revised during the five-year plan update intervals.

An evaluation tool called 'STAPLEE' was used to review the benefits and costs associated with each mitigation action. The STAPLEE concept employs a technique for identifying, evaluating, and prioritizing mitigation actions based on existing local conditions (FEMA, 2008). This method provides set factors with which to review the feasibility of implementing each proposed mitigation action. The results of the STAPLEE evaluations were factored into each mitigation action's priority determination, based on the level of benefits that each action provided. Table 40 details the factors incorporated into the STAPLEE evaluation that was completed for each mitigation action. Such an analysis allowed plan participants to weigh the pros and cons of implementing the proposed mitigation actions included in this plan.

Table 40 – STAPLEE Evaluation Factors		
	Evaluation Category	**Evaluation Criteria**
S	Social	Evaluated in terms of community acceptance. Does the action have social benefits?
T	Technical	Evaluated in terms of feasibility. Will the action help to reduce losses in the long-term with minimal secondary impacts? Does the action act as a partial or complete solution?
A	Administrative	Evaluated based on staffing, funding, and maintenance requirements. Do the participating jurisdictions have the personnel and capabilities to implement the action? Are additional resources required?
P	Political	Evaluated by political leadership and emergency management acceptance. Will the action receive political support?
L	Legal	Evaluated based on legal authority to undertake an action. Which unit of government is likely to undertake the action?
E	Economic	Evaluated according to funding availability and budget constraints. Where will funding for the action come from?
E	Environmental	Evaluated based on impacts to the environment. Would implementation of the action create negative consequences to environmental assets?

In addition to the factors included in STAPLEE, the following considerations were also included when evaluating the mitigation actions (FEMA, 2008):

- Compatibility with goals and objectives identified in the current NYS Hazard Mitigation Plan
- Compatibility with goals and objectives identified in the local mitigation strategy
- Assessment of the impact of identified actions on other jurisdictions within the entire planning area or region
- Cost/benefit reviews of potential actions
- Funding priorities identified in the current NYS Hazard Mitigation Plan
- Compatibility with other local and regional plans and programs

Each participating jurisdiction evaluated the mitigation actions that were applicable to their jurisdiction. These evaluations were completed in accordance

with the STAPLEE factors identified above, the additional considerations also listed above, and the results of a cost/benefit analysis. Once the evaluations were completed, each action was prioritized according to its benefits and costs. Each mitigation action is accordingly recognized as a high priority project, medium priority project, or low priority project, as indicated on the STAPLEE forms. The results of the evaluation process for each mitigation action and the results of the action prioritization exercise are included in the STAPLEE criteria consideration tables, included as Appendix G. The priority levels assigned to each proposed mitigation action by the applicable jurisdiction(s) are also provided on the STAPLEE forms included in Appendix G. Since each jurisdiction analyzed its own applicable mitigation actions, some of the proposed mitigation actions received differing priority rankings, depending on the community performing the review and their available resources.

The benefit and cost rankings assigned to proposed mitigation actions, and included in the STAPLEE criteria consideration tables, were determined as indicated in Table 41.

Table 41 – Benefit and Cost Rankings

	Assessment Levels and Description		
	High	**Medium**	**Low**
Benefits	Action is anticipated to have an immediate impact on reduction of losses – both life and property.	A long-term impact on the reduction of loss of life is expected or an immediate impact on loss of property.	It is difficult to assess the benefits of an action due to its long-term timeframe.
Costs	Existing funding sources are inadequate or are not identified to cover implementation of the action.	Funding exists, but will have to be reapportioned or budgeted over multiple years.	Funds to implement action are available in existing budget.

Actions recorded as having a benefit level equal to or higher than the cost level, were viewed as cost-beneficial actions, therefore receiving a high priority ranking. This priority ranking process should be viewed as a preliminary analysis. As the implementation of mitigation strategies is progressed, the ranking system used during this evaluation will evolve based on input from participating jurisdictions, agency representatives, and other branches of state

and federal government. Additional funding sources will be required for many of the proposed mitigation actions. Coordination with agencies such as NYSOEM and FEMA will be necessary to secure funds for proposed mitigation actions, especially those with high costs and long-term implementation schedules.

8.6 National Flood Insurance Program (NFIP)

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement, particularly at a local level. The NFIP is regulated by FEMA. The goal of this program is to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2009).

Communities that participate in the NFIP adopt floodplain ordinances that require that all insured structures that are damaged over 50-percent of the property's market value must comply with the floodplain ordinance when the structure is repaired/re-built. These repairs could mean changes to the elevation of the structure, acquisition and demolition, or relocation to a location outside of the floodplain. Insured structures that are located within floodplain identified on FEMA's Flood Insurance Rate Maps (FIRMs) receive funds if impacted by a flooding disaster. These distributed funds are to be used to mitigate the risk of future flooding by actions such as those previously referenced.

The NFIP and other flood mitigation actions are important to the protection of public and private property and public safety. Flood mitigation is valuable to communities in the following ways (FEMA, 2009):

- Creates safer environments by reducing loss of life and decreasing property damage;

- Allows individuals to minimize post-flood disaster disruptions and recover quicker (homes built to NFIP standards receive less damage from flood events - when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impact on individuals, communities, and society.

The land value, total value, and improvement value for properties in each Oswego County municipality that are located within FEMA's existing 100-year mapped floodplain are provided in Appendix H. The affected properties are categorized by their Property Class Code. The only jurisdiction not represented in Appendix H is the Town of Boylston. There are only 8 parcels within Boylston that are located in 100-year floodplains and none of them are included in any of the Class Codes listed in Appendix H (State Forest Land).

8.6.1 Oswego County National Flood Insurance Program (NFIP) Participation

National Flood Insurance Program records and claims were analyzed to determine the extent of participation, flood losses, and flood insurance policies within Oswego County. The majority of all jurisdictions within the County are current community participants in the NFIP. The jurisdictions who are not current participants consist of the Town of Orwell, the Town of Palermo, and the Town of Williamstown (FEMA, NFIP, 2012). Table 42 provides loss statistics for all jurisdictions within Oswego County as of June 30, 2012.

Table 42 – NFIP Loss Statistics for Municipalities in Oswego County, Jan. 1, 1978 – June 30, 2012 (Bureau Net, Claim Information, 2012)

Jurisdiction	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments
(T) Albion	1	0	0	1	$0.00
(V) Altmar	9	8	0	1	$77,513.56
(T) Amboy	-	-	-	-	-
(T) Boylston	-	-	-	-	-
(V) Central Square	4	2	0	2	$4,533.18
(V) Cleveland	32	27	0	5	$164,171.23
(T) Constantia	16	12	0	4	$145,089.16
(C) Fulton	11	7	0	4	$18,567.56
(T) Granby	1	1	0	0	$5,164.25
(T) Hannibal	-	-	-	-	-
(V) Hannibal	-	-	-	-	-
(T) Hastings	8	6	0	2	$36,876.22
(V) Lacona	-	-	-	-	-
(T) Mexico	3	0	0	3	$0.00
(V) Mexico	9	6	0	3	$9,315.91
(T) Minetto	3	2	0	1	$100,493.82
(T) New Haven	1	0	0	1	$0.00
(T) Orwell	-	-	-	-	-
(C) Oswego	13	11	0	2	$381,869.07
(T) Oswego	5	3	0	2	$1,924.02
(T) Palermo	-	-	-	-	-
(T) Parish	2	1	0	1	$9,937.36
(V) Parish	-	-	-	-	-
(V) Phoenix	1	1	0	0	$623.50
(V) Pulaski	4	3	0	1	$1,171.00
(T) Redfield	-	-	-	-	-
(T) Richland	8	4	0	4	$4,493.98
(T) Sandy Creek	12	6	0	6	$27,034.59
(V) Sandy Creek	-	-	-	-	-
(T) Schroeppel	21	13	0	8	$45,444.16
(T) Scriba	10	8	0	2	$29,403.57
(T) Volney	1	0	0	1	$0.00
(T) West Monroe	20	15	0	5	$106,180.25
(T) Williamstown	-	-	-	-	-

Total losses = all losses submitted regardless of status, total claims
Closed losses = losses that have been paid
Open losses = losses that have not been paid in full
CWOP losses = losses closed without payment
Total payments = total amount paid on losses
Jurisdictions that are dashed indicate that no loss records are available

The flood loss data included in Table 42 indicates that the Village of Cleveland experiences the largest frequency of impact to property from flood events. The City of Oswego, though not having files as many loss claims, has received the highest amount of total payments. Both of these jurisdictions are located along the shoreline of major waterbodies (Oneida Lake and Lake Ontario, respectively), consequently increasing their potential for flooding hazard events. The information included in Table 43 documents the number of flood insurance policies, coverage amounts, and premium amounts for all jurisdictions within Oswego County.

Table 43 – NFIP Policy Statistics for Municipalities in Oswego County, Jan. 1, 1978 – June 30, 2012 (Bureau Net, Policy Information, 2012)

Jurisdiction	Policies In-Force	Insurance In-Force (Whole $)	Written Premium In-Force
(T) Albion	1	$350,000	$405
(V) Altmar	1	$46,200	$424
(T) Amboy	4	$254,200	$2,081
(T) Boylston	1	$350,000	$365
(V) Central Square	3	$371,400	$1,873
(V) Cleveland	3	$651,500	$3,348
(T) Constantia	51	$8,284,100	$40,925
(C) Fulton	13	$2,437,000	$18,725
(T) Granby	23	$3,110,800	$13,777
(T) Hannibal	-	-	-
(V) Hannibal	1	$210,000	$343
(T) Hastings	60	$8,869,700	$46,032
(V) Lacona	2	$170,000	$1,172
(T) Mexico	15	$2,536,200	$10,018
(V) Mexico	3	$544,800	$4,353
(T) Minetto	7	$1,109,800	$8,380
(T) New Haven	3	$337,100	$1,483
(T) Orwell	-	-	-
(C) Oswego	19	$2,225,200	$13,118
(T) Oswego	3	$351,000	$1,830
(T) Palermo	-	-	-
(T) Parish	3	$385,000	$856
(V) Parish	-	-	-

Table 43 – NFIP Policy Statistics for Municipalities in Oswego County, Jan. 1, 1978 – June 30, 2012 (Bureau Net, Policy Information, 2012)			
Jurisdiction	**Policies In-Force**	**Insurance In-Force (Whole $)**	**Written Premium In-Force**
(V) Phoenix	10	$1,605,400	$7,746
(V) Pulaski	12	$1,947,100	$14,125
(T) Redfield	1	$140,000	$274
(T) Richland	21	$3,262,100	$16,241
(T) Sandy Creek	38	$6,042,300	$28,352
(V) Sandy Creek	1	$210,000	$343
(T) Schroeppel	65	$10,023,500	$57,975
(T) Scriba	17	$2,422,400	$15,256
(T) Volney	7	$2,217,500	$8,064
(T) West Monroe	64	$9,932,100	$51,582
(T) Williamstown	-	-	-

Policies in-force = NFIP policies as of June 30, 2012
Insurance in-force = coverage amount for policies in-force
Written premium in-force = premium paid for policies in-force

The Towns of Constantia, Hastings, Schroeppel, and West Monroe are shown to have the greatest amount of flood insurance policies. These jurisdictions also have the highest written premium in-force and the highest insurance in-force, a direct correlation to the fact that they have the greatest number of policies in-force. Ten (10) repetitive flood loss properties are documented within Oswego County. The locations of these properties and the combined repetitive losses paid for each affected jurisdiction are detailed in Table 44.

Table 44 – Repetitive Flood Loss Properties in Oswego County (NYSEMO)	
Location	**Repetitive Loss Paid ($)**
Village of Altmar	$ 47,714
Town of Constantia	$ 26,662
Town of Hastings	$ 12,322
City of Oswego	$318,147
Town of Oswego	$ 14,818
Town of West Monroe	$ 68,396
Oswego County	**$488,059**

Despite many efforts, further information associated with these repetitive flood loss properties could not be obtained.

8.6.2 NFIP Hazard Mitigation

As part of the Oswego County Hazard Mitigation Plan, each participating jurisdiction was required to evaluate a specific set of mitigation actions specifically aimed at continued compliance and participation with FEMA's NFIP. The mitigation actions included in the Oswego County Hazard Mitigation Plan, which have been proposed in order to reduce the impacts of flood hazard events, consist of the following:

- Update and revise floodplain management ordinances to comply with FEMA regulations;
- Designate/install a Floodplain Management Administrator;
- Install/train staff members to adequately enforce NFIP regulations and floodplain ordinances;
- Update/revise floodplain ordinances to comply with current and future FEMA FIRMs;
- Require staff involved with the management of floodplains and enforcement of ordinances to become Certified Floodplain Managers; and
- Join the Community Rating System (CRS).

The CRS is a voluntary incentive program that recognizes and encourages floodplain management activities at the community level. As a result of CRS participation, flood insurance premium rates are discounted to reflect the reduced flood risk that results from community actions to meet the three goals of the Community Rating System (FEMA, 2010):

- Reduce flood loss;
- Facilitate accurate insurances ratings; and
- Promote flood insurance awareness.

Appendix I includes STAPLEE Criteria Consideration Tables that pertain solely to the mitigation actions related to the compliance and participation in FEMA's National Flood Insurance Program. Each participating jurisdiction individually evaluated and prioritized these NFIP compliance actions. For the mitigation action associated with floodplain management consistent with future new FIRMs, it was noted that the flood maps for Oswego County are currently being updated. The preliminary completion and release of this revised mapping has not been announced. This re-mapping event was considered by all jurisdictions during their evaluation of the NFIP compliance criteria and mitigation action prioritization parameters. Once the revised mapping is released by FEMA, any changes and considerations that should be incorporated into the Plan will be added during a future annual Plan update, as appropriate.

9.0 Plan Maintenance

This Oswego County hazard mitigation plan will change and adapt as time progresses and changes occur within the County and local jurisdictions. The Disaster Mitigation Act of 2000 requires that adopted mitigation plans define and document the processes and mechanisms for maintaining and updating the hazard mitigation plan at least once every five years in order for the participating jurisdictions to remain eligible for funding. This hazard mitigation plan maintenance process must include:

- Monitoring and evaluating the plan;
- Updating the plan;
- Providing an implementation schedule; and
- Outlining steps for continued public involvement.

In order to keep the County's hazard mitigation plan current and build upon previous hazard mitigation planning efforts, successes, and failures, Oswego County will utilize members of the Southern, Central, and Northern Working Groups to monitor, evaluate, and update the plan on an annual basis.

9.1 Monitoring, Evaluating, and Updating the Plan

The three working groups that were established at the beginning of this process will act as a mitigation committee that will be responsible for meeting annually to discuss the implementation of the mitigation plan and identify any needed revisions. It is recognized that with increased growth and the passing of time, there may be changes in jurisdiction representatives on the mitigation committee. Any representative changes will be indicated when the plan is revised. This meeting will be planned and facilitated by members of the Oswego County Emergency Management Office. The mitigation committee may also meet to evaluate and revise the County's mitigation plan following a major disaster event. This would allow committee members to determine if the actions recommended in the plan are appropriate or to see if any changes are necessary

based on the pattern of disaster damages. The Director of the County's EMO will be tasked with approving all proposed additions and updates to the plan.

One month prior to the annual plan review meeting, a reminder will be distributed to each jurisdiction representative. This reminder will engage representatives to think of how risks and hazards have changed within their jurisdiction or at the County level, whether the goals and objectives identified in the plan still address the current concerns of their jurisdiction and the County, and whether the status of any proposed mitigation action has changed or whether additional actions should be included. The implementation of proposed mitigation actions is important to review in order to determine whether the plan is being executed correctly and to the optimal extent. Items that should be reviewed for each mitigation action include the current status of the action, the ultimate cost of the action, the success (if completed action), and the funding sources used for the action.

During the annual plan review meeting between the mitigation committee and the County EMO, each jurisdiction will provide an update to the group of his/her review of the plan and the implementation details for the proposed mitigation actions that apply to their jurisdiction. Notes of the annual meeting will be kept and will include specific details associated with any proposed changes to the plan. During re-approval years (every 5 years), once revisions are approved by the Director of the Oswego County EMO, the revised plan will be submitted to FEMA for re-approval in accordance with the five year review schedule dictated in DMA 2000.

9.2 Implementation Schedule

To summarize, the proposed hazard mitigation plan five-year review schedule that will be completed as follows:

- Jurisdiction representatives comprising the mitigation committee will meet with Oswego County EMO representatives and other involved individuals on an annual basis to discuss the implementation and specifics of the County mitigation plan. Meeting discussions will be documented, including proposed changes to the plan. All discussion and proposed changes will be kept in Appendix J of the plan document.
- When a five year update is required, the mitigation committee and County EMO will meet approximately 18 months prior to the plan's expiration date to update and revise all elements of the plan and produce a final revised document.
- This updated plan will be presented to the boards of each participating jurisdiction in order for each jurisdiction to formally concur with and adopt the proposed changes.
- Once all participating jurisdictions have re-adopted the hazard mitigation plan, the revised plan will be submitted to FEMA for re-approval.

9.3 Incorporation Into Existing Planning Mechanisms

Elements of the plan will be considered during municipal and County-wide development and comprehensive planning. The approved hazard mitigation plan will also serve as an important resource for developing and/or updating emergency operations plans and procedures throughout Oswego County. Table 45 lists the various planning mechanisms and capabilities of each jurisdiction participating in Oswego County's hazard mitigation planning process. The County's Multi-Jurisdictional All-Hazard Plan will be incorporated into, and referenced by, future updates of the plans, policies, ordinances, programs, studies, reports, and staff listed in Table 45.

Table 45 – Planning Mechanisms and Capabilities for Each Participating Jurisdiction

	Jurisdiction																													
Planning Mechanism	**Town of Albion**	**Village of Altmar**	**Town of Amboy**	**Town of Boylston**	**Village of Central Square**	**Village of Cleveland**	**Town of Constantia**	**City of Fulton**	**Town of Granby**	**Village of Hannibal**	**Town of Hannibal**	**Town of Hastings**	**Village of Lacona**	**Village of Mexico**	**Town of Mexico**	**Town of New Haven**	**Town of Orwell**	**City of Oswego**	**Town of Oswego**	**Village of Parish**	**Town of Parish**	**Village of Pulaski**	**Town of Redfield**	**Town of Richland**	**Village of Sandy Creek**	**Town of Sandy Creek**	**Town of Scriba**	**Town of Volney**	**Town of West Monroe**	**Town of Williamstown**	**Oswego County**
Plans																														
Comprehensive/Land Use Plan	X		X		X	X	X	X	X		X	X			X		X	X	X	X	X	X		X			X	X	X		X
Economic Development Plan								X				X						X		X	X										X
Post-disaster Recovery Plan	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Flood Mitigation Plan																															
Local Waterfront Revitalization Plan						X		X				X						X									X				
College Campus Plan																		X	X												
Emergency Response/Evac Plan																															X
Open Space Plan																															
Watershed Protection Plan	X		X			X	X	X	X			X	X				X	X			X	X	X	X					X	X	X
Capital Improvement Plan								X										X				X									X
Redevelopment Plan																															
Floodplain Management Plan																															
Comprehensive Emer. Mgmt. Plan	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Policies/Ordinances																															
Building Codes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Zoning/Land Use Codes/Restriction			X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X		X			X	X			
Subdivision Regulations	X				X	X	X	X	X	X	X	X			X			X	X	X	X	X	X	X			X	X	X		
Property Set-back Ordinance			X	X	X			X	X		X				X			X	X			X						X			
Flood Regulations	X	X			X	X	X	X		X			X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	
Steep Slope Ordinance																															
Stormwater Ordinance								X			X									X											
Site Plan Review Requirements			X		X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X		
Real Estate Disclosure Requirement	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Programs																															
NFIP Participant	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		
NFIP CRS Participating Community																															
Property Acquisition Program																															
Public Education/Awareness Prog.	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X

Table 45 – Planning Mechanisms and Capabilities for Each Participating Jurisdiction

Planning Mechanism	Jurisdiction																													
	Town of Albion	Village of Altmar	Town of Amboy	Town of Boylston	Village of Central Square	Village of Cleveland	Town of Constantia	City of Fulton	Town of Granby	Village of Hannibal	Town of Hannibal	Town of Hastings	Village of Lacona	Village of Mexico	Town of Mexico	Town of New Haven	Town of Orwell	City of Oswego	Town of Oswego	Village of Parish	Town of Parish	Village of Pulaski	Town of Redfield	Town of Richland	Village of Sandy Creek	Town of Sandy Creek	Town of Scriba	Town of Volney	Town of West Monroe	Town of Williamstown	Oswego County
Stream Maintenance Program	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Storm Drainage Maint. Program						X	X	X	X	X	X	X	X	X	X		X	X			X	X		X	X	X	X	X			X
Mutual Aid Agreements	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Studies/Reports																															
Hazard Analysis/Risk Assessment	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Floodplain Maps/Insurance Studies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hydrologically/Hydraulic Studies																															
Staff/Development																															
Development Planner								X				X						X													X
Building Code Official	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
GIS and/or HAZUS Specialist																															X
Engineer/Public Works Official								X				X						X		X											X
Local Floodplain Administrator	X	X			X	X	X	X		X			X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	
Environmental Cons. Specialist																															X
Public Information Official	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X

This table will be updated as additional mechanisms or capabilities are added by the participating jurisdictions. Table 46 displays how this Hazard Mitigation Plan will be incorporated into the existing and future planning mechanisms and opportunities for each participating jurisdiction.

Table 46 – Planning Mechanism Incorporation

Mechanism	How Plan Will be Incorporated
Emergency Planning	• Plan will be added/referenced as an Appendix to the County's Emergency Response/Evacuation Plan. • Hazard risk assessment and vulnerability data included in the mitigation plan will be reviewed during emergency planning and Emergency Response/Evacuation Plan updates.
Annual Budget	• Mitigation actions will be considered when setting the annual budgets within participating jurisdictions.
Plans and Programs	• Hazard Mitigation Plan information will be considered by each participating jurisdiction during program and protection updates and revisions. • Programs and plans will be compared to the Hazard Mitigation Plan to ensure that goals and objectives are consistent among all documents.
Grant Applications and other Funding Opportunities	• Data and maps from the HMP will be used as supporting documentation in grant applications. • Mitigation actions included in the Plan will be heavily considered during application submission and fund allocation.
Economic Development	• Hazard vulnerability information will be reviewed and utilized during the siting of local development efforts within participating jurisdictions.
Capital Improvement Planning	• Current and future projects will be reviewed for hazard vulnerability. Hazard resistant construction standards will be incorporated into the design and location of potential projects, as appropriate.

9.4 Adding Participating Jurisdictions

Jurisdictions located within Oswego County that are not currently included as participating jurisdictions in this version of the hazard mitigation plan may be added during five-year plan updates. In order to be added, these jurisdictions should put forth an effort to complete a similar risk assessment and mitigation strategy and implementation procedure that the other jurisdictions completed as part of this planning process.

9.5 Continued Public Involvement

It is the intent of Oswego County to keep the public informed about the hazard mitigation planning efforts, actions, and projects that occur within the County. To accomplish this goal, and in addition to the public involvement already incorporated into the completion and review of this document, the following opportunities for public involvement in this ongoing process will be made available:

- A web link will be provided on Oswego County's website that will include a digital copy of the hazard mitigation plan and a list of upcoming planning activities and plan updates;
- Public announcements of and invitations to annual mitigation committee planning meetings and five-year mitigation plan update events; and
- Completion of public outreach and mitigation training events throughout the County, especially in higher risk hazard areas.

Public outreach efforts will be documented in future plan updates through the inclusion of samples, copies of notices, flyers, web announcements, and/or meeting minutes. If public response is lacking during subsequent update processes, additional ways to expand participation will be considered. Coordination efforts between the Oswego County Emergency Management Office and the participating jurisdictions and departments involved in the development of this planning document will continue to keep the plan current and feasible. Public outreach ideas that may be implemented to increase participation include:

- Distribute targeted questionnaires to local civic, community, and non-profit groups to received public feedback;
- Organize topic specific meetings with key individuals and experts to discuss particular concerns and brainstorm solutions; and

- Hold education programs during various community events to disseminate information and engage the public in discussions on mitigation planning and hazard preparation.

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Appendix A

Sample Adoption Resolution

Appendix B

Completed County and Single and Multi-Jurisdictional Risk Assessments

Appendix C

HIRA-NY Program Guidelines

Appendix D

Sites in Oswego County Included on the National Register of Historic Places

Appendix E

Asset Identification and Vulnerability Worksheets for Each Jurisdiction

Appendix F

County and Shared Hazard Mitigation Action Implementation Details

Appendix G

STAPLEE Criteria Consideration Table

Appendix H

Values Associated with Properties Located within FEMA Mapped 100-year Floodplains for Each Jurisdiction

Appendix I

National Flood Insurance Program
STAPLEE Criteria Consideration Tables

Appendix J

Documentation: Annual Plan Review Discussion and Proposed Revisions (to be added)