

Appendix B
Jurisdictional Annexes

Oswego County Hazard Mitigation Plan Order of Jurisdictional Annexes

- Oswego County
- Albion, Town
- Amboy, Town
- Boylston, Town
- Central Square, Village
- Cleveland, Village
- Constantia, Town
- Fulton, City
- Granby, Town
- Hannibal, Town
- Hannibal, Village
- Hastings, Town
- Lacona, Village
- Mexico, Town
- Mexico, Village
- Minetto, Town
- New Haven, Town
- Orwell, Town
- Oswego, City
- Oswego, Town
- Palermo, Town
- Parish, Town
- Parish, Village
- Phoenix, Village
- Pulaski, Village
- Redfield, Town
- Richland, Town
- Sandy Creek, Town
- Sandy Creek, Village
- Schroepfel, Town
- Scriba, Town
- Volney, Town
- West Monroe, Town
- Williamstown, Town

Oswego County

Jurisdictional Annex

Oswego County

1.0 Contacts

The primary contacts for Oswego County regarding this plan were identified as follows:

- Terry Bennett - Emergency Services Program Coordinator
Address: 200 N 2nd St, Fulton, NY 13069
Phone: (315) 591-9160
Email: Terry.Bennett@oswegocounty.com
- Cathleen Palmitesso - Director, Emergency Management
Address: 200 N 2nd St, Fulton, NY 13069
Phone: (315) 591-9150
Email: Cathleen.Palmitesso@oswegocounty.com

County Website: <http://www.oswegocounty.com/>

2.0 Municipal Profile

Population

The 2016 American Community Survey estimated that 120,513 people live in Oswego County. The County's population has decreased since the 2000 Census population (122,377) by 1.5% (U.S. Census Bureau, 2016).

Location

Oswego County is located in central New York and is bordered by Jefferson County to the north, Lewis and Oneida County to the east, Madison, Onondaga, and Cayuga County to the south, and Cayuga County and Lake Ontario to the west. Major transportation routes within the County include Interstate 81, U.S. Route 11, and a number of heavily travelled state and county routes.

Brief History

Oswego County was formed in 1816 from the original limits of Onondaga and Oneida County. The area, rich in natural resources, was originally occupied by Native Americans and later by European settlers beginning in the 1600s. The County's strategic location on Lake Ontario drove development, as it was used as a military post along the American border in the 1700s and was home to three military forts in Oswego. After the Revolutionary War, land within

the County was purchased by George Scriba (Scriba's Patent). A number of settlements were established within Scriba's Patent, particularly along Oneida Lake and Lake Ontario. The lumber industry was significant in the County's early days, as well as agriculture. Trade and industrial development grew along the Oswego and Oneida Rivers, Oneida Lake, and Lake Ontario throughout the 1800s. The natural resources still present in the County today provide a number of recreational opportunities. Agriculture, manufacturing, and energy production remain important to the local economy as well (White, 2016).

Governing Body

Oswego County is governed by a twenty-five (25) member County Legislature.

Future Growth

Since the County's 2012 HMP, a number of new developments have been completed throughout the County. See Section 2.0, Future Growth, in the City, Town, and Village jurisdictional annexes (Appendix B of the main body of the Plan) for details.

3.0 Hazard Vulnerabilities and Ranking

3.1. Risk Assessment

The following scale was developed to determine hazard vulnerability for the jurisdiction. Each event was given a ranking from one (1) through three (3) for the severity of impact based on extent, onset warning, impact in damages and injury, and frequency: three (3) represents the greatest impact (large area, no warning, severe damage, and regular occurrence); two (2) represents moderate impact (several locations, hours of warning, moderate damage, and infrequent occurrence); and one (1) represents low impact (one location, days of warning, minor damage, and rare occurrence). The scores for each of these four (4) categories were used to assign an overall vulnerability for each hazard, as follows:

- Low: 5 or less
- Moderate: 6 to 8
- High: 9 or greater

Table 1: Hazard Vulnerability by Event						
Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Vulnerability Rank	County Rank
Severe Thunderstorm, Wind, or Tornado	2	1	3	3	High	1
Flood	2	2	3	3	High	2
Ice Storm	3	1	3	2	High	3
HAZMAT Transit	1	3	2	1	Moderate	4
HAZMAT Fixed	1	3	1	1	Moderate	5
Utility Failure	3	3	3	1	High	6
Terrorism	2	3	2	1	Moderate	7
Severe Winter Storm	3	1	2	3	High	8
Epidemic	2	1	2	1	Moderate	9
Transportation Accident	1	3	2	2	Moderate	10
Radiological (Fixed Site)	2	3	2	1	Moderate	11
Extreme Temps	3	1	1	2	Moderate	12
Water Supply Contamination	2	3	2	1	Moderate	13
Infestation	3	1	2	1	Moderate	14

3.2. Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by Oswego County. The tables below denote the number and locations of critical facilities within the County.

Table 2 - Oswego County Critical Facilities				
Facility	Facility Type	Location	Parcel in Floodplain	Structure(s) in Floodplain
Oswego County Airport	Airport	40 Airport Dr, Fulton	100YR	No
McFee Ambulance	Ambulance	52 Watson Ave, Mexico	No	No
North Shore Ambulance	Ambulance	136 Bridge St, Cleveland	No	No
Northern Oswego County Ambulance (NOCA)	Ambulance	21 Delano St, Pulaski	No	No
Oswego County Ambulance Service (Menter's Ambulance)- Central Square	Ambulance	8 Gertrude Dr, Central Square	No	No
Oswego County Ambulance Service (Menter's Ambulance)- Fulton	Ambulance	404 Oneida St, Fulton	100YR, 500YR	100YR, 500YR
Oswego County Ambulance Service (Menter's Ambulance)- Oswego	Ambulance	35 E. Cayuga St, Oswego	No	No

Table 2 - Oswego County Critical Facilities				
Facility	Facility Type	Location	Parcel in Floodplain	Structure(s) in Floodplain
SAVAC SUNY Oswego	Ambulance	53 Sheldon Ave, Oswego, NY 13126	No	No
Cayuga Community College (Fulton Campus)	Education	11 River Glen Dr, Fulton	No	No
CiTi-BOCES - Center for Instruction, Innovation and Technologies	Education	179 CR 64, Mexico	No	No
SUNY Oswego Campus	Education	7060 NY Rt. 104, Oswego	100YR, 500YR	No
Alternate county EOC at Oswego Fire Dept., Eastside Station	Emergency	35 E. Cayuga St, Oswego	No	No
Alternate E-911 Center at Oswego County Office Building	Emergency	200 N. Second St., Fulton	No	No
Exelon Joint Information Center	Emergency	4 Airport Dr, Fulton (Town of Volney)	No	No
Oswego County Emergency Operations Center	Emergency	200 N. Second St., Fulton	No	No
Oswego County Emergency Response Training Center (ERTC/Fire Coordinator's Office)	Emergency	720 E. Seneca St., Oswego	100YR	No
Oswego County Fairgrounds	Fairgrounds	9261 County Rt 22A, Sandy Creek, NY 13145	100YR	No
County Buildings & Grounds	Government	111 E. 11th St., Oswego	100YR, 500YR	100YR, 500YR
County Courthouse- Pulaski	Government	2 Broad St, Pulaski, NY 13142	No	No
County Legislative Office Building	Government	46 E. Bridge St., Oswego	No	No
NY State Barge Canal	Government	1 Canal View Dr, Oswego. Locks in Oswego (3), Minetto, Fulton (2)	-	-
Oswego County Dept. of Social Services	Government	100 Spring St, Mexico	No	No
Oswego County Health Department	Government	70 Bunner St, Oswego	No	No
Port of Oswego Authority	Government	1 E. Second St, Oswego	100YR, 500YR	No
U.S. Customs and Border Patrol Station	Government	19 E. Schuyler St, Oswego	No	No
County Highway Dept	Highway Dept.	31 Schaad Dr, Oswego	100YR and 500YR	No
County Highway Dept	Highway Dept.	957 Centerville Rd, Richland	100YR, 500YR	No
County Highway Dept (radiological Personnel Monitoring Center)	Highway Dept.	39 Dill Pickle Alley, Parish	No	No
Oswego Hospital (Oswego Health)	Medical	110 W. Sixth St., Oswego	No	No
US Army Reserve Center	Military	60 E. 9th St, Oswego	No	No
US Coast Guard Station	Military	1 Lake St, Oswego	100YR, 500YR	No
NYS Dept. of Transportation	NYSDOT	NY-104 at I-81, Parish	No	No
NYS Dept. of Transportation	NYSDOT	NY-3, Granby	No	No
NYS Dept. of Transportation (County maintenance residency)	NYSDOT	5855 Scenic Ave, Mexico	No	No

Table 2 - Oswego County Critical Facilities				
Facility	Facility Type	Location	Parcel in Floodplain	Structure(s) in Floodplain
NY State Police	Police	1013 S. 1st. St, Fulton	No	No
NY State Police	Police	1134 US-11, Central Square, NY 13036	No	No
NY State Police	Police	3273 County Rt 2, Pulaski, NY 13142	100YR, 500YR	No
Oswego County Public Safety Center (E-911 Center, Sheriff's Department, Correctional Facility)	Police	39 Churchill Rd, Oswego	No	No
City of Oswego Lake Water Pumping and Treatment Station	Public Utility	30 Sheldon Ave, Oswego	100YR, 500YR	No
Exelon Emergency Offsite Facility	Public Utility	County Route 176, Fulton (Town of Volney)	No	No
Metropolitan Water Board (MWB) Lake Water Pumping and Treatment Station and Pipeline	Public Utility	1633 Rathburn Rd (treatment plant)	No	No
Onondaga County Water Authority pipelines in Oswego County	Public Utility	throughout County	-	-
Camp Hollis	Recreation	40 Health Camp Rd, Oswego, NY 13126	100YR, 500YR	No
NYS Department of Environmental Conservation Training Center	Training Facility	24 CR 2A, Pulaski	100YR, 500YR	No

4.0 Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about the selected hazards including frequency, history, and severity is included within Section 5.0 of the main body of the Plan.

The probability of climate-related hazard events is expected to increase in the future within Oswego County. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have locally available documentation of past occurrence, but were included in this annex for future mitigation planning consideration.

4.1 Natural Hazards

The natural hazards that were evaluated as part of the County's CEPA analysis are further detailed below. This information includes a description of the hazard, risk assessment, historical occurrences and damage estimates within Oswego County, and the probability of future hazard

events and associated losses. 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 often 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. The NWS estimates damage costs using all available data, but property and crop damages listed for individual storms are considered broad estimates and total damages are often higher than those reported by the NCDC.

4.1.1 Severe Thunderstorm, Wind, or Tornado

Hazard Description

Severe storms as defined by HIRA-NY include severe thunderstorms (with associated severe wind events such as derechos, gustnados, and downbursts), hail storms, and windstorms. The National Weather Service definition defines a severe thunderstorm storm as a storm with a tornado, surface hail $\frac{3}{4}$ " or greater, or wind gusts 50 knots (58 mph) or greater, or all three. Severe thunderstorms 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, and about 10% of these are classified as severe. Thunderstorms can produce deadly and damaging tornadoes, hailstorms, intense downburst and microburst winds, lightning, and flash floods. 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 five to seven minutes.

Lightning, which occurs during 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. A derecho is a widespread and long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. 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

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 miles (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. There is potential for winds from 160 to 200 mph to occur in Oswego County, as it is within both Wind Zones 2 and 3 (Figure 5.1, Appendix A).

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. 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, automobiles and aircraft, but rarely cause fatalities or serious injury.

Geographic Extent and Frequency

Severe storms can occur throughout a large region of the county but typically affect several individual locations during one event. Severe wind and severe storms occur multiple times per year in Oswego County and arrive with no warning. Additional details regarding the extent of different types of severe storms experienced by Oswego County are provided below.

Thunderstorms are characterized based on the amount of rainfall per duration of time. In Oswego County, rainfall during a two-year storm are typically around 0.93 inches per hour. Rainfalls during a five-year storm are typically around 1.24 inches per hour (NOAA, 2015). The heaviest rainfall in the County tends to occur near the Towns of Hastings, Schroepfel, Redfield, Orwell, and Boylston, as well as the Villages of Phoenix and Central Square.

High winds are characterized using the Beaufort Wind Scale (Table 5.1, Appendix A). High wind events in Oswego County typically have velocities between 50 and 55 knots, though some wind storms have been reported up to 68 knots. Wind velocities between 48-55 knots have a force of 10 (storm) on the Beaufort Scale (Edwards, 2018). Wind forces of 11 (violent storm, 56-63 knots) and 12 (hurricane, 64 knots or greater) have occurred in Oswego County but are not common. Wind gusts or downbursts can be described as microbursts or macrobursts (NWS, 2019). Microbursts extend 2.5 miles or less and last between 5 and 15 minutes, and can cause winds up to 168 mph. Macrobursts extend greater than 2.5 miles and last between 5 and 30 minutes. These events can cause winds up to 134 mph. Microbursts have occurred in Oswego County in the past.

Hailstorms are categorized on the TORRO Hailstorm Intensity Scale (TORRO, 2019), which is provided in Table 5.2 (Appendix A). The most damaging hail storms that have occurred in Oswego County produced hail that was 2.5 inches in diameter, which corresponds with category H7 on the TORRO Scale.

Tornadoes are measured using the Enhanced Fujita scale. Historically, tornadoes have ranked as an F0 or F1 magnitude on the Enhanced Fujita (F) Scale (with one instance of an F3 tornado) in Oswego County. The Enhanced Fujita Scale is provided in Table 5.3 (Appendix A). Tornadoes with an F0 or F1 ranking have 3-second wind gusts between 65 and 110 mph.

Historical Hazard Occurrences and Damage Estimates

Severe wind and severe storms can occur throughout a large region of the county and can result in additional hazards such as fire, flood, landslide, structural collapse, transportation accident, and utility failure. 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.

Major historical severe storm events that have occurred in Oswego County are summarized below. Severe thunderstorms including derechos have occurred in the county but not to the extent of requiring a Presidential Declaration of Disaster. Severe storms in Oswego County have caused property damages ranging from \$10,000 to over \$200,000 and crop damages ranging from \$5,000 to \$50,000. Severe storm records with geographic location coordinates provided by the NCDC are also depicted in Figure 5.2 (Appendix A).

- April 16, 2018: 13,000 National Grid customers lost power for up to 36 hours due to high winds gusting to 50 mph throughout the county but mostly in the eastern and central portions.
- July 8, 2014: a severe thunderstorm caused power outages and damage throughout Oswego County. Nearly 10,000 National Grid customers lost power. Trees and wires were pulled down, and several homes in the City of Oswego and Town of New Haven were impacted. The winds destroyed most of the projection screen at the Midway Drive-In (Town of Minetto), which was closed until the screen could be replaced. Wind gusts were recorded at 60 to 70 mph. The NCDC records estimated that this storm caused nearly \$50,000 in property damage.
- May 16, 2009: thunderstorms with strong damaging winds traveled from Hinmansville (Town of Granby) to the Town of Williamstown, causing an estimated \$10,000 in property damage.
- June 10, 2008: a line of severe thunderstorms with high wind traveled across the Finger Lakes into Oswego County. The storms produced hail up to $\frac{3}{4}$ inch in diameter and wind

gusts estimated to near 70 mph. The storms cut power for several communities through the evening. Phoenix, Oswego and Sandy Pond were hit, with the greatest damage in Sandy Pond and the Town of Sandy Creek. The Town of Sandy Creek declared a local state of emergency. The NCDC estimated a total of \$220,000 in property damage.

- 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 and City of Oswego.
- August 3, 2003: a thunderstorm downburst overturned three small private planes at the Oswego County Airport (Town of Volney). Trees and power lines were downed in the City of Fulton and Town of Volney, and winds tore a roof off of a house in the Town of Granby. The NCDC estimates property damage at \$250,000.
- June 26, 2002: the chairman of the Oswego County Legislature declared a county state of emergency due to severe weather that caused downed trees and power lines from the City of Fulton to Town of Redfield.
- September 7, 1998: the Labor Day Storm that traveled across New York State struck the southern end of Oswego County. The derecho caused a power outage and damage in and surrounding the Village of Phoenix.
- Several tornadoes have occurred in Oswego County, including a 1986 tornado that touched down in the City of Fulton. The frequency of occurrence has been about once every other year, with waterspouts forming offshore on Lake Ontario annually. Historic tornado tracks are depicted in Figure 5.3 (Appendix A).

National Climactic Data Center's (NCDC) severe storm records that have occurred since those documented in the County's 2012 HMP are listed in Table 5.4 (Appendix A).

Probability of Future Events and Relation to Climate Change

Severe storms occur within Oswego County multiple times per year, and this frequency will likely continue in the future. A severe storm event could also cause fires, flooding, landslides, utility failure, structural collapse, and transportation accidents. 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 (EOC) to coordinate resources and manage human needs. High winds could cause moderate damage to private property and public facilities. Older structures in deteriorating condition are more likely to incur property damages. Manufactured and mobile homes are also less able to withstand damages from severe storm events. In Oswego County, nearly one-third (31%) of occupied homes were built in 1939 or earlier, and about 16% are mobile homes.

Severe storms were analyzed as a very high likelihood event during the County's 2017 CEPA update. The County is fairly well equipped and trained to respond to severe storm events; however, upgrading existing equipment along with multi-jurisdictional coordination efforts and agreements may help to alleviate some of the pressure on post-disaster maintenance and clean-up forces.

The frequency and magnitude of severe storm events is expected to be affected by climate change. The amount of precipitation per storm event is expected to increase, while the length of time between such storms is expected to decrease, causing stronger, more frequent severe storms (Rosenzweig et al., 2011; Horton et al., 2014; NYS DHSES, 2014).

4.1.2 Flood

Hazard Description

Flooding is a natural event for rivers and streams. Excess water from snowmelt, rainfall, or storm surge 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.

While flooding in Oswego County has been considered a moderately low hazard in the past, the County identified it as a high likelihood of occurrence with a very high consequence rating during the 2017 CEPA update. The hazard became more of a concern in recent years with record flooding of the shoreline of Lake Ontario in 2017 and 2019, and several heavy rainfall events that resulted in flash flooding and areal flooding throughout the County.

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. Topography and vegetative cover type 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 seasonally when precipitation is highest. Excessive snowmelt can cause flooding during the spring in areas like Oswego County. Flash floods are characterized by high water velocity and can cause severe erosion. Coastal flooding, which occurs when water levels rise above normal, is also a major concern in Oswego County along the shore of Lake Ontario. Coastal flooding generally occurs more gradually than flash flooding.

Geographic Extent and Frequency

In Oswego County, flooding can occur along the shoreline of Lake Ontario and along the banks of the county's major rivers (the Oswego River, Oneida River, and Salmon River). The Oswego River drains the Finger Lakes as well as Oneida Lake and the Oneida River. The Salmon River drains the Salmon River Reservoir and western portion of the Tug Hill Plateau. Flooding can also occur throughout the county along smaller streams and ponds.

FEMA updated the floodplain mapping for Oswego County and issued new Flood Insurance Rate Maps (FIRMs) in June 2013. Areas within the Special Flood Hazard Area (SFHA), or 100-year floodplain, are the most vulnerable to flood events. The 100-year floodplain designates an area that has, on average, a 1% chance of flooding in any given year. In Oswego County, the 100-year floodplains are primarily located 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. FEMA also designates 500-year floodplain areas, which have a 0.2% chance of flooding annually. Floodplain mapping and the NYS Coastal Boundary are shown on Figure 5.4 (Appendix A).

Flooding can occur with several hours warning through monitoring systems by the National Weather Service, hydroelectric plants, highway department personnel and other programs. While serious injury or death can occur but not in large numbers, flooding can result in moderate damage to private property and moderate structural damage to public facilities.

According to Table 5.5 (Appendix A), approximately 23% of Oswego County is within a mapped 100-year floodplain, including 13,494 parcels located among all jurisdictions except the Town of Boylston. Coastal flooding is of concern along the shore of Lake Ontario. Lake Ontario borders seven jurisdictions in Oswego County, including the City of Oswego, and Towns of Oswego, Scriba, New Haven, Mexico, Richland, and Sandy Creek. County press releases regarding a number of recent flood events are provided in Appendix F.

Historical Hazard Occurrences and Damage Estimates

Flooding is New York State's most consistently damaging natural hazard, though Oswego County experiences fewer floods than many other Counties in the State. Major historical flood records and damage estimates in Oswego County are summarized below. NCDC records for flood events that have occurred since those described in the County's 2012 HMP are summarized in Table 5.6 (Appendix A).

- May to September 2019: High water levels on Lake Ontario, 248.98 ft. above mean sea level (amsl), and record precipitation during those months resulted in severe flooding along the Lake Ontario shoreline. Oswego County Legislature Chairman James

Weatherup declared a local state of emergency due to flooding conditions on the Lake Ontario Shoreline on May 14 and issued a Local Emergency Order the same day to implement a no wake zone for the shoreline. Both were extended throughout the summer until September 6. All jurisdictions in Oswego County with shoreline property were affected, including the Town and City of Oswego and Towns of Scriba, New Haven, Mexico, Richland, and Sandy Creek. Substantial damage to residences along the shoreline occurred, with many residents reporting repairs made following the 2017 flooding were washed away. Damage estimates were still being compiled in October 2019.

- June 14-15, 2019: Cracks identified by New York State Canal Corporation in the structure that holds a tainter gate adjoining Lock O-1 in Phoenix resulted in a threat of flooding along the Oswego River from Phoenix to Fulton. Eagle Creek Energy Company enacted their Dam Emergency Plan at the Yellow Alert Level. The Canal Corporation closed the Oswego Canal from Lock 0-1 to Lock 0-3, and law enforcement patrolled the area to ensure no boats or anglers entered the water while repairs were made to the tainter gate. The tainter gate was successfully repaired on June 15 and the canal was reopened by 6:30 p.m.
- June 20, 2019: Flash flooding occurred in parts of Oswego County from the Town of Hannibal to the Town of Richland when a system dropped between 2.43 and 4.2 inches of rain from early morning through early afternoon. The Town of Oswego and the City of Oswego declared local states of emergency when many town and city roads were unpassable for several hours due to flooding. Two residences in Oswego Town were condemned following flood damage, and two town roads were closed for a few weeks. Oswego County Legislature Chairman James Weatherup issued a county-wide state of emergency at 2:10 p.m. The City of Oswego required assistance from the county and New York State to address flooding in a water-treatment facility.
- June 20, 2019: Flash flooding throughout Oswego County and especially in the Town of Oswego, where 4 inches of rain had fallen by early afternoon, threatened an earthen dam at the SUNY Oswego Rice Creek Field Station. Due to the threat, the Town of Oswego called for the non-mandatory evacuation of 13 homes downstream and conducted mass-dialing and door-to-door emergency notifications. New York State repaired the dam overnight on June 20-21, allowing residents to return early June 21.
- April and May 2017: High water levels on Lake Ontario (248.95 ft amsl) and record precipitation during those months resulted in severe flooding along the Lake Ontario shoreline. All jurisdictions in Oswego County with shoreline property were affected, including the Town and City of Oswego and Towns of Scriba, New Haven, Mexico, Richland, and Sandy Creek. A minimum of \$23 million damages throughout the County was estimated for businesses, full-time and seasonal residences, and public entities along the lakeshore. Flooding began in early May and continued until early fall. In Oswego

County, sanitary sewers in Oswego Town were impacted, and the Port of Oswego in the City of Oswego sustained millions of dollars of damage, along with hundreds of homes and businesses (marinas and campgrounds, among others). A Presidential Declaration in November 2017 provided Public Assistance for damages, and New York State made funds available for uninsured losses by businesses and residents.

- October 27, 2017: Areal flooding occurred throughout the County when approximately 2 inches of heavy lake effect rain fell. Roads in The Towns of Sandy Creek, Richland, Mexico, New Haven and Oswego were impacted and several roads were closed for part of the day due to flooding.
- September 30, 2010: Flash flooding occurred along the Salmon River when 3.2 inches of rain fell on the western side of the Tug Hill Plateau, from the Town of Redfield to Lake Ontario. The flash flood was caused by 3.2 inches of rainfall that fell overnight and the release of 16,000 to 17,000 CFS from two Brookfield Power hydroelectric stations. The high water levels destroyed a retaining wall in the Village of Pulaski and flooded several roads in the Towns of Richland, Albion, and Redfield. The heavy rainfall also resulted in road closures in the Towns of Constantia, Mexico, Parish, Sandy Creek, and Scriba. Property damage was estimated at \$100,000, including the Village of Pulaski's retaining wall.
- April 16, 1994: Flooding occurred along the shoreline of Oneida Lake, affecting the Towns of West Monroe and Constantia and Village of Cleveland. The NCDC estimated that this event caused \$50,000 in property damages.
- May 1993: Flooding occurred along the shoreline of Oneida Lake. No damage estimates are available.
- December 29, 1984: Flooding along the Salmon River caused evacuation and property damages in the Village of Altmar and Village of Pulaski. This was a presidential disaster declaration, though few records of the event remain.

Probability of Future Events and Association with Climate Change

Flooding in Oswego County is a regular event that occurs between once a year and once every other year. Possible cascading effects from flooding could include dam failure, fire, hazmat (fixed site), oil spill, structural collapse, transportation accident, utility failure, and water supply contamination. Flooding can occur with several hours warning through monitoring systems by the National Weather Service, hydroelectric plants, highway department personnel and other programs. While serious injury or death can occur but not in large numbers, flooding can result in moderate damage to private property and moderate structural damage to public facilities.

Flooding is a concern to the County as a whole, particularly along Lake Ontario, Oneida Lake, and the Salmon River, where large-scale flood events have occurred in the past. Low-lying

properties along Lake Ontario are frequently inundated and eroded as a result of minor coastal flooding events.

The Town of Constantia has the greatest number of parcels that intersect the 100-year floodplain (984), which primarily consists of residential properties along the shore of Oneida Lake. The Town of Scriba has the greatest structure value of parcels intersect the 100-year floodplain (\$1,795,121,399), which is influenced by the nuclear power plant facilities located along the shore of Lake Ontario. The City of Oswego has the next highest value of properties within 100-year floodplains (\$192,026,741).

Flooding 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. National Flood Insurance Program (NFIP) policy, claim, and repetitive loss statistics for Oswego County are summarized in Section 8.0.

Climate change is likely to impact the severity and frequency of flooding in Oswego County. With the anticipated increase in severe storms due to climate change, heavy precipitation and associated floods will likely become more common (Horton et al., 2014). The annual average amount of precipitation is projected to increase by up to 10% over the next 30 years. Due to this projected increase, the frequency and severity of flash flooding events in New York State are expected to rise (Rosenzweig et al., 2011). Increased precipitation during winter months could lead to more floods during that time of year, especially if the ground is frozen and less permeable. In addition, rising air and water temperatures would cause ice and snow to melt more rapidly, leading to flooding during the winter and early spring months.

4.1.3 Ice Storm

Hazard Description

Ice storms include freezing rain that accumulates in a substantial glaze layer of ice resulting in serious disruptions of normal transportation and possible downed power lines. The National Weather Service (NWS) uses the term 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. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulation are accumulations of ¼" or greater. Damage can include structural damage, utilities, tree damage due to excessive weight. Ice storms can result in additional hazards of explosion, fire, food shortage, fuel shortage, structural collapse, transportation accident, utility failure, and water supply contamination.

Geographic Extent and Frequency

Ice storms can impact large portions of the County or the entire County at once. Serious injury or death is likely but not in large numbers, and ice storms can cause moderate damage to private property and severe structural damage to public facilities. Storms can occur with several days warning and can last two to three. Freezing rain is forecast at least once a year for Oswego County. The intensity of ice storms is measured using the Sperry-Piltz Ice Accumulation Index (Table 5.7, Appendix A). Ice storms in Oswego County typically correspond with an ice damage index of 2 on this scale. In addition, ice storms often correspond with severe winter storms, which can be characterized using the Regional Snowfall Index (NOAA, 2019) and rate of snowfall per duration of time. The Regional Snowfall Index is provided in Table 5.8 (Appendix A). Snow storms in Oswego County typically result in 12-18 inches of snow accumulation or more per day but do not typically register on the Regional Snowfall Index.

Historical data indicates ice storms have occurred about once a year to once every seven years in the region. The NCDC reports three ice storm events that have occurred in Oswego County, but property damage estimates were included for only one event.

Historical Hazard Occurrences and Damage Estimates

Oswego County has been impacted by three ice storm events in the past. The North Country Ice Storm of 1998 just missed Oswego County. During that storm, Niagara Mohawk Power Corporation (now National Grid) replaced 2,300 large towers and more than 8,000 power poles in multiple counties in Northern New York, with the outage lasting over a month. County ice storm records are detailed below and summarized in Table 5.9 (Appendix A).

- April 3, 2003: An ice storm began on April 3, 2003 and lasted for several days. This storm was a Presidential Disaster Declaration. Up to an inch of ice accumulation was measured, which caused downed trees, limbs, and power and telephone lines, and power outages in some areas lasted a week. Several shelters were opened to house people without utilities. This storm resulted in a Presidential Disaster Declaration and FEMA Public Assistance funding to Oswego County and its municipalities and public agencies totaled \$1,539,660. This ice storm resulted in \$28.6 million in property damage and \$8.6 million in crop damages.

Probability of Future Events and Association with Climate Change

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. The probability of a future event is moderately high. 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.

During the 2017 CEPA update, the County ranked ice storms, with at least ½ inch of ice, as having a high likelihood of occurrence and high consequences. 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.

Climate change will cause a rise in temperatures and total annual precipitation over the next several decades. The impact of climate change on the frequency and severity of ice storms is unpredictable for the northern part of New York State (including Oswego County), while the southern part of the state may experience fewer ice storms (Rosenzweig et al., 2011, Horton et al. 2014).

4.1.4 Severe Winter Storm

Hazard Description

Severe winter storms in Oswego County have a very high likelihood of occurrence but a medium ranking for consequences, according to the County's 2017 CEPA update. Severe winter storms occur more than once a year throughout most or all of the county with several days warning. Such storms last as much as a week and could result in structural collapse and transportation accidents.

A severe winter storm is defined by Oswego County as a heavy lake effect snow storm that puts the county into an emergency condition and/or requires the declaration of a state of emergency or the opening of an emergency operations center. Recent history shows such storms often have a snowfall rate of two to four inches per hour or more.

Outside the normal snow season (before November 1 or after March 31), a heavy snowfall would have a more severe impact, as heavy snow on trees with their leaves still on would bring down branches and power lines. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold. Winter storms can result in flooding, storm surge, closed highways, blocked roads, downed power lines and hypothermia. Lake effect snow is created when cold, dry air passes over a large warmer lake, such as one of Lake Ontario, and picks up moisture and heat.

Geographic Extent and Frequency

A severe winter storm according to this definition can immobilize a portion of the County or the entire County, severely limiting the ability of emergency response agencies to respond to local emergencies. Lake Effect Snow Warnings are issued by the NWS when pure lake effect snow may pose a hazard or is life-threatening. Severe winter storms and Lake Effect Snow Warnings occur multiple times per year in Oswego County. Severe winter storms are characterized using the Regional Snowfall Index (NOAA, 2019) and rate of snowfall per duration of time. The Regional Snowfall Index is provided in Table 5.8 (Appendix A). Snow storms in Oswego County often result in 12-18 inches of snow accumulation or more per day but do not typically register on the Regional Snowfall Index.

Historical Hazard Occurrences and Damage Estimates

All NCDC winter storm records that have occurred since those described in the County's 2012 HMP are summarized in Table 5.10 (Appendix A). Major winter storm events for Oswego County are described in detail below.

- December 26, 2017: The City of Oswego declared a local state of emergency and issued a local emergency order for no unnecessary travel and no parking on city streets after a lake effect snow storm dropped over 30 inches of snow on the city in less than 24 hours. During the same storm, the Town of Boylston issued a news release requesting snowmobilers to wait until roads were cleared before traveling town roads. Both municipalities and the Town of Redfield received NYS Department of Transportation assistance to clear roads and intersections.
- December 15, 2016: The NWS issued a blizzard warning for Oswego County. A peak wind gust of 84 mph was measured at the Oswego Harbor, and true blizzard conditions were realized for several hours across much of the county. The high winds tore the roofs of two houses in the Town of Scriba. The National Climatic Data Center estimates damages at \$100,000.
- February 3-12, 2007: A record lake effect storm dropped up to 14 feet of snow in some areas of the County. The county opened an Emergency Operations Center on February 8th, closing it 13 days later on February 21st. New York State Governor Eliot Spitzer declared Oswego County a State Disaster Area February 8th and the state's Transportation Infrastructure Group (TIG) was mobilized to assist 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.
- January 28-31, 2004: A lake effect storm impacted the Oswego River Corridor and the central section of the county but caused little impact in the northern region. The FEMA

declared a Snow Emergency for the County. FEMA dispersed more than \$349,020 in Oswego County in public assistance costs eligible for reimbursements.

- March 12-13, 1993: 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 50 feet of snow on the City of Oswego in 48 hours.
- January 27-31, 1966: “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 mph. during the storm. The snow was badly drifted and roads and schools closed as long as a week. Drifts covered entire two-story houses. A total of 102 inches of snow was recorded in Oswego.

Probability of Future Events and Association with Climate Change

During the County’s 2017 CEPA update, severe winter storms were determined to have a very high likelihood of occurrence and a medium ranking for consequences. As temperatures rise over the next few decades due to climate change, the length of the snow season in New York State is expected to decrease. However, changes in the severity of snow storm events are uncertain, particularly for microclimates like Oswego County and other areas in lake-effect snow zones (Horton et al. 2014).

4.1.5 Extreme Temperatures

Hazard Description

Extreme temperature events are defined by extended periods of excessive cold or hot weather with a serious impact on human and/or animal populations, particularly elderly and/or persons with respiratory ailments. Specifically, prolonged extreme temperature events lasting for at least three days with a temperature colder than -10°F (cold wave) or hotter than 95°F (heat wave) were considered under this hazard. In extreme heat and high humidity, evaporation is slowed and the body must work harder to maintain a normal temperature. Extreme heat exposure may result in symptoms such as sunburn, dehydration, heat exhaustion, or heat stroke. The National Weather Service (NWS) Heat Index, a function of temperature and relative humidity, indicates the likelihood that someone could develop a heat disorders. In extreme cold conditions, people can experience wind chill, frostbite, or hypothermia. Exposure to extreme temperatures for prolonged periods of time can result in death. The NWS wind chill temperature index is a function of temperature and wind velocity. The NWS heat and wind chill indices (Figures 5.5 and 5.6) are included in Appendix A.

Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or

people who cannot afford to sufficiently heat or cool their homes. In general, Oswego County jurisdictions and other rural communities are used to excessive cold or hot temperatures. Excessive cold has resulted in ice jams on the Salmon, Little Salmon, Oswego and Oneida Rivers. In Oswego County, extreme temperatures are a moderately low hazard, impacting mostly individuals in vulnerable populations.

Geographic Extent and Frequency

Extreme temperatures can impact a large region within the County or the entire County. Extreme temperature events are highly likely to occur in Oswego County in the future. It is possible for prolonged periods (greater than one week) of extreme hot or cold temperatures to occur anywhere within Oswego County.

Historical Hazard Occurrences and Damage Estimates

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.

Major extreme temperature events in Oswego County are summarized below. NCDC records for extreme cold/wind chill and frost/freeze events that have occurred since those included in the County's 2012 HMP are summarized in Table 5.11 (Appendix A). Oswego County is primarily impacted by excessive cold events.

- January 24, 2011: An extreme cold/wind chill event occurred, causing about \$15,000 in crop damages according to the NCDC.
- February 1, 1993: 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.
- October 8, 1993: 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.

Probability of Future Events and Association with Climate Change

Extreme temperature events can cause severe injury or death but not in large numbers. Extreme temperatures would cause little or no damage to private property and little or no structural damage to public facilities. Cascading effects could include contamination from extreme heat, fire, ice jam, transportation accident, and utility failure.

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. However, extreme temperature events are likely to change over the next century related to climate change. It is anticipated that extreme heat events will increase in frequency and duration, and extreme cold events will likely decrease due to an average increase in overall temperature (Horton et al., 2014).

4.1.6 Infestation

Hazard Description

Oswego County is vulnerable to an infestation due to this hazard's moderate extent and moderate impact potential. The emerald ash borer (EAB) is of primary concern. Much of the County consists of undeveloped forested land. Ash trees comprise up to 16-30% per total basal area of forests in the County according to the NYSDEC (Figure 5.8, Appendix A of the main body of the plan), which are susceptible to emerald ash borer infestation.

Geographic Extent and Frequency

An EAB infestation could affect any locations in the County with ash trees. Stands of ash trees along roadways are of primary concern. There are existing EAB populations in the southern portion of the County and it is expected that EAB will continue to spread throughout the entire county in the coming years.

Historical Hazard Occurrences and Damage Estimates

Existing EAB infestations were confirmed in the southern part of Oswego County in 2017, and confirmed in the Town of Sandy Creek in 2018. Jurisdictions in the southern portion of Oswego County, including the Towns of Hannibal, Granby, Volney, Schroepel, Palermo, Hastings, West Monroe, and Constantia, Villages of Hannibal, Phoenix, Central Square, and Cleveland, and City of Fulton are within the EAB restricted zone defined by the NYSDEC. The restricted zone in NYS generally encompasses existing infestation locations as of May 2017. The transport of ash tree materials (wood, logs, untreated firewood, nursery stock, and wood chips) outside of the restricted zone was prohibited under 6 NYCRR 192.7, Control of the Emerald Ash Borer in order to control the spread of this species and protect existing, un-infested stands of ash trees. In

addition, this legislation prohibited the transport of untreated firewood originating anywhere in NY State more than 50 miles from its origin. The NYSDEC repealed this law on July 25, 2018. It was determined that the regulations were no longer effective in slowing the spread of EAB, and the financial costs of implementing the regulations outweighed the benefit of protecting the existing ash stands. The NYSDEC noted that harvesting ash trees before infestation spreads further is likely in the best interest of foresters and land owners (NYSDEC, 2017).

Probability of Future Events

The EAB is likely to continue to spread throughout Oswego County. Susceptible areas include forested land dominated by ash trees, in addition to County road right-of-ways along forested areas, parkland, and trails. As EAB spreads and ash trees die, the trees could fall at any time and cause injury, property damage, or utility outages if along roadways. More populated areas with ash trees planted along Village or neighborhood streets are also susceptible to infestation. The loss of street trees can result in a significant aesthetic change to established residential areas. National Grid, the utility providing electric and gas service to Oswego County, has implemented a formal tree cutting program to minimize power outages and damage where trees are poised to fall on electric lines as a result of the widespread emerald ash-borer infestation.

4.2 Technological or Human-Caused Hazards

4.2.1 Hazardous Materials in Transit

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.

Geographic Extent and Frequency

A hazardous materials in transit incident 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 River, the Oneida River, (sections of the NYS Barge Canal System), and the Port of Oswego located at the mouth of the Oswego River.

Historical Hazard Occurrences and Damage Estimates

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. The County response to 6 Level III or greater HAZMAT in transit

accidents annually, and 12 incidents per year that are below Level III. Major events are detailed below.

- In November 2005, 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. The propane tank remained intact during the accident, but the potential for an explosion while it was recovered led to a voluntary evacuation of a 2-mile radius, which took several hours as police and fire agencies went door-to-door to inform neighboring residents of the event.
- On August 31, 2012, an ammonia spill occurred at the Birdseye Plant in the City of Fulton. The spill was effectively contained by emergency responders, including the Oswego County Hazardous Materials Team, Oswego County Health Department, NYSDEC Spill Response, and the Fulton Fire Department. Residents around Jerome Street and Gansvoort Street were evacuated out of caution. The Fulton War Memorial and Community Room at the Fulton Municipal Building were opened for any residents who wished to stay overnight outside of the affected area. A public notice regarding this event is included in Appendix F.
- In March 2015, a propane truck travelling through the County experienced an internal leak.
- In March 2015, a vehicle entered the Oswego River at Stop 13.
- In November 2015, a motor vehicle accident caused a car on a bridge to leak into a stream.
- A motor vehicle accident occurred in the Town of Granby on NY-3, involving a tank truck that caught on fire.
- A motor vehicle accident caused an asphalt tank truck to spill.

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.

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 could occur include the County Airport in the Town of Volney and the Port Authority properties in the City 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. 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.

4.2.2 Hazardous Materials Fixed Site

Hazard Description

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

Geographic Extent and Frequency

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

Historical Hazard Occurrences and Damage Estimates

Hazardous materials incidents have occurred in recent history; however, none have resulted in large, damaging incidents and remained mostly contained at the facility sites. 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. Recent HAZMAT fixed site incidents that occurred in Oswego County are described below.

- August 2012: Ammonia Leak at former Birdseye Foods Plant. Affected residents were sheltered at Fulton War Memorial.
- December 2013: Ammonia Leak at K&N Foods. A shelter in place message was sent to 572 phones.
- June 2017: Freon Leak in Fulton City Hall.
- August 2017: Odor in Campus Building at SUNY Oswego. Two workers were transported for medical treatment. The chemicals involved in drain cleaning produced hydrogen sulfide gas.
- November 2017: Acid vapors at Champlain Valley Specialty of NY (off of NY-104 in the Town of Oswego). Workers were affected by vapors from stripping epoxy floor finish.

Probability of Future Events

A hazardous materials accident at a fixed site in Oswego County is possible. The County currently has 56 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 considered to have a high likelihood of occurrence in Oswego County with high consequences. During the Oswego County hazard analysis, it was determined that hazmat incidents occur regularly, 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 nature of the incident.

4.2.3 Utility Failure

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, and failures to other utility infrastructure that relies on electricity. Sustained power outage (three days or more) have a high likelihood of occurrence and would have high consequences in Oswego County. A widespread electrical power outage could cause traffic accidents at stoplights, civil unrest, and failures in other essential utilities such as water and sewage that depend on electrical power. While utility failures that have occurred in the past have been minor, a prolonged event could stress emergency services. Most utility failures that occur in Oswego County are the result of natural hazards such as severe storms, ice storms, and winter storms.

Geographic Extent and Frequency

Power outages could occur throughout a large region in the county and could result in other hazards such as fire; food shortage; fuel shortage; failures of utilities, and water supply contamination. Power outages occur with no warning several times a year throughout Oswego County and can last two to three days. Serious injury or death is likely, but not in large numbers, and this hazard could cause moderate damage to private property and little or no structural damage to public facilities.

Historical Hazard Occurrences and Damage Estimates

Oswego County has been impacted by several utility failure events, summarized below.

- June 27, 2007: A telecommunications outage for the Windstream network around the City of Fulton affected telephone and related services for several hours.
- August 2003: A blackout 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.

There are no other records of extensive utility outages recorded for the County. It is common for public utilities to be temporarily affected during severe storm events. 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.

Probability of Future Events

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. 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.

4.2.4 Terrorism/Large-Scale Violent Attacks

Hazard Description

Terrorism is defined by the FBI as the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. Terrorism and large-scale violent attacks may cause community disruption and/or multiple injuries or deaths.

Geographic Extent and Frequency

A terrorism event or large-scale violent attack 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. County critical facilities are depicted on Figure 2.9 (Appendix A).

Historical Hazard Occurrences and Damage Estimates

Terrorism events specific to Oswego County consist of bomb threats at multiple schools. 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.

Although the severity of a terrorism event or large-scale violent attack 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 federal 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. Oswego County and its municipalities, school districts, law-enforcement, emergency response agencies, and private entities such as nuclear power plants

and major industry have implemented active shooter response plans that include training and exercises.

Probability of Future Events

Terrorism and large-scale violent attacks are infrequent in Oswego County. The severity of a terrorist attack or large-scale violent attack would likely be high, especially related to the number of injuries that may occur. Possible cascading effects associated with terrorism 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.

4.2.5 Epidemic

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.

Geographic Extent and Frequency

An epidemic has a medium likelihood of occurrence with high consequences in Oswego County, according to the 2017 CEPA results. An epidemic could affect the entire County or a large region of the County.

Historical Hazard Occurrences and Damage Estimates

In August 2018, mosquitoes in Toad Harbor Swamp in the Town of West Monroe tested positive for eastern equine encephalitis (EEE). Two horses, one in West Monroe and the other in the Town of Williamstown, died of EEE in August and October 2018, respectively. No human cases of EEE were reported between January 2017 to October 2018, and one human case of West Nile Virus was reported in Oswego County in 2017 (NYSDOH, 2017 and NYSDOH, 2018).

The H1N1 flu virus affected 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.

Since 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 more densely developed areas such as the City of Fulton and City of Oswego, or at SUNY Oswego and

Cayuga Community College, where a large amount of people frequent a small area of the County.

Probability of Future Events

Mosquito-borne illnesses such as eastern equine encephalitis (EEE) are of primary concern in Oswego County. Mosquitoes are monitored in the Toad Harbor Swamp for these viruses, and the County conducts monitoring annually in portions of the Towns of Hastings, West Monroe, and Constantia along Oneida Lake to control mosquito populations. The County Health Department also conducts a public health education program on preventing mosquito bites. If an outbreak of EEE were to occur in the County, it could result in multiple infections or deaths.

4.2.6 Transportation Accident

Hazard Description

A transportation accident is defined as an accident on land, water, or in the air resulting in mass casualties or a substantial loss of property.

Geographic Extent and Frequency

According to the 2017 CEPA update, a transportation accident has a medium likelihood of occurrence with high consequences in Oswego County. The County contains a number of major transportation routes (Interstate 81, U.S. Route 11, State Route 481, State Route 104, State Route 3, and a number of other state and county routes). In addition, a transportation accident could occur on waterways within the County such as the Salmon, Little Salmon, Oswego and Oneida Rivers, Oneida Lake, the Oswego Harbor, and Lake Ontario. The Oswego County Airport functions as a relief for the Syracuse Hancock International Airport, and therefore an air transportation accident has potential to occur in Oswego County as well. As described in Section 2.6, all railroads within the County are freight-only lines. In particular, there is high potential for transportation accidents to occur on heavily travelled roadways, especially as a result of poor road conditions during a winter storm or ice storm. Though only a small geographic area of the County would be affected by a transportation accident, this hazard has the potential to lead to multiple severe injuries or loss of life.

Historical Hazard Occurrences and Damage Estimates

While small-scale vehicular accidents are relatively common in Oswego County, especially in poor weather conditions, there are no records of major transportation accidents involving mass casualties or substantial loss of property in the County. However, even small-scale transportation accidents have the potential to cause serious injury or death to a small number of people.

Probability of Future Events

Major transportation accidents are infrequent, but the County remains susceptible to future incidents along major transportation routes, particularly as a result of natural hazards such as a severe winter storm or ice storm. A number of multi-vehicle accidents have occurred along Interstate 81. Transportation accidents do not pose a large risk to infrastructure, however, they are likely to cause injuries or loss of life. Maintaining roadway safety and clearly designating evacuation routes can aid in prevention of transportation accidents.

4.2.7 Radiological Fixed Site

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).

Geographic Extent and Frequency

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 has established substantial public notification and planning efforts in that area.

Historical Hazard Occurrences and Damage Estimate

Oswego County is home to three nuclear power plants located in the Town of Scriba – Exelon Generation's Nine Mile Point Nuclear Station Units 1 and 2 and the James A. FitzPatrick Nuclear Power 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 30-plus year operation life, none of the emergencies have caused any threat to public health and safety. 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 probability of occurrence within Oswego County.

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. During the 2017 CEPA update, the County determined that a nuclear power plant accident would have a low likelihood of occurrence, but very high consequences according to HIRA-NY definitions. Potential cascading effects related to a fixed-site radiological release include air contamination, civil unrest, and transportation accident. Any incidents of serious injury or death from a nuclear power plant incident would be well within the established 10-mile radius.

4.2.8 Water Supply Contamination

Hazard Description

Water supply contamination is defined as the contamination of surface or subsurface public drinking water supply by chemical or biological materials that restricts the use of the water source. Groundwater wells can experience contamination due to flooding, stormwater recharge (the percolation of stormwater runoff from the soil surface to groundwater), fertilizer runoff, or hazardous material spills.

Geographic Extent and Frequency

The County determined that water supply contamination has a low likelihood of occurrence but high consequences if it were to occur. Contamination of public water supplies could occur in any location with a municipal water system. As summarized in Table 2.10 (Appendix A), 24 jurisdictions are at least partially served by public water supply systems. Most systems are supplied by groundwater wells. The others are served by the Onondaga County Water Authority (OCWA) which provides water from Lake Ontario and other sources in these locations. Several municipalities are currently undertaking projects to expand their existing water service areas, including the Towns of Hastings, Richland, and Sandy Creek.

Historical Hazard Occurrences and Damage Estimates

There are no reports of public water supply contamination within Oswego County. Contamination of public water systems can necessitate costly system projects in order to improve or replace existing infrastructure (tens to hundreds of thousands of dollars). Many residents in

Oswego County depend on private wells. In some areas, water quality is an ongoing concern. In addition, flooding can contribute to well contamination, which is a growing concern throughout the County, particularly along the shore of Lake Ontario. Contamination issues with private wells require disinfection and/or filtration systems to be installed, which can cost hundreds to thousands of dollars.

Probability of Future Events

The probability of a water supply contamination event to occur in Oswego County is relatively low. However, many municipalities with public water systems rely on groundwater wells. Groundwater supplies can be contaminated due to flood events, hazardous material spills, or vandalism. If such an event were to occur, a number of injuries and significant damage to public infrastructure could result.

5.0 Capability Assessment

5.1 Planning and Regulatory Capability

The County's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 3, below.

Table 3. Planning Mechanisms and Capabilities		
Planning Mechanism	Oswego County	Notes
Plans		
Comprehensive/Land Use Plan	X	
Economic Development Plan	X	
Post-Disaster Recovery Plan	X	
Emergency Response/Evacuation Plan	X	
Watershed Protection Plan	X	
Capital Improvement Plan	X	
Comprehensive Emergency Management Plan	X	
Programs		
Public Education/Awareness Program	X	
Stream Maintenance Program	X	Highway Dept. Responsible
Storm Drainage Maintenance Program	X	Highway Dept. Responsible
Mutual Aid Agreements	X	Agreements with Cities/Towns/Villages
Studies/Reports		
Hazard Analysis/Risk Assessment	X	Oswego County HMP- 2012
Floodplain Maps and/or Studies	X	FEMA- 2013
Staff/Development		
Development Planner	X	Planning Dept.
GIS and/or HAZUS Specialist	X	Planning Dept.
Engineer/Public Works Official	X	
Environmental Conservation Specialist	X	
Public Information Official	X	

5.2 Emergency Communications, Routes, and Shelters

Oswego County utilizes the HyperReach emergency communications system, which notifies residents of emergency situations via a voice and/or text message sent directly to their phone. Landline phone numbers are automatically enrolled in the notification system, and residents may opt-in to be notified by HyperReach on their cell phones online at:

<https://secure.hyper-reach.com/comsignup.jsp?id=12481>

The main north-south evacuation route in the County is Interstate 81. U.S. Route 11 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. In addition to Interstate Route 81, U.S. Route 11, and numerous local roadways, Oswego County includes fourteen (14) NYS Routes (104, 104A, 104B, 3, 13, 176, 183, 264, 34, 48, 481, 49, 69, and 69A) and nine (9) County Routes (16, 43, 176, 57, 28, 34, 4, 26, 3). Major roadways are depicted in Figure 2.8 (Appendix A of the main body of the Plan).

Emergency shelter locations, as well as potential temporary and permanent housing locations for displaced residents, are addressed at the City, Town, and Village level. Details are provided in each municipality's jurisdictional annex (Appendix B of the main body of the Plan). A comprehensive list of emergency shelters located within Oswego County is provided in Table 6.2 (Appendix A of the main body of the Plan).

6.0 National Flood Insurance Program

FEMA issued updated Flood Insurance Rate Maps (FIRMs) and digital floodplain data for Oswego County in June 2013. All jurisdictions in Oswego County are included in this updated flood mapping, and data are available online at: <https://msc.fema.gov/portal>.

There are an estimated 107,526 acres of land in the County that are located within mapped 100-year floodplains and 1,048 acres in mapped 500-year floodplains. It is noted that the 100-year floodplain acreage includes the area of Oneida Lake. A 100-year flood indicates a flood elevation that has a 1-percent chance of being equaled or exceeded each year. A 500-year flood indicates a flood elevation that has a 0.2-percent chance of being equaled or exceeded in any given year. According to the 2014 NYS Hazard Mitigation Plan, the total building inventory value in Oswego County was approximately \$7.95 million (\$5.93 million residential, \$2.02 million non-residential (NYS DHSES, 2014). Approximately 14,793 tax parcels within Oswego County intersect the mapped 100-year floodplain, 8,685 of which are residential and 417 are agricultural. A total of 388 are covered by NFIP policies—2.6% of all properties intersecting the mapped 100-year floodplain.

Thirty-one of the 33 jurisdictions in Oswego County participate in the NFIP. Currently, the Town of Palermo and Town of Williamstown do not participate in the NFIP. The Town of Palermo does, however, have a local floodplain ordinance (Local Law No. 5 of 1999). Neither Town experiences significant flooding issues, according to local records. Details regarding NFIP claims and losses for each jurisdiction are presented in each municipality's annex (Appendix B of the main body of the Plan). None of the jurisdictions within Oswego County participate in the Community Rating System (CRS) program. 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 CRS: reduce flood loss, facilitate accurate insurance ratings, and promote flood insurance awareness (FEMA, 2016).

NFIP policy data and loss statistics (as of July 31, 2018) were obtained from FEMA to determine the extent of participation, flood losses, and active flood insurance policies in Oswego County. Tables 8.1 and 8.2 (Appendix A of the main body of the Plan) summarize the number of flood insurance policies in-force and claims filed to date for each jurisdiction in Oswego County. Jurisdiction-level data is also summarized in each jurisdictional annex (Appendix B of the main body of the Plan).

Table 8.1 (Appendix A of the main body of the Plan) summarizes the number of flood insurance policies, coverage amounts, and premium amounts for all jurisdictions in Oswego County as of July 31, 2018. No policy data are available for the Villages of Lacona, Sandy Creek, or Parish, though these communities all participate in the NFIP. No policy data are available for the Towns of Palermo or Williamstown because they do not currently participate in the NFIP. It is noted that while policy data are shown for the Village of Altmar, this Village was dissolved in 2012 and is now part of the Town of Albion. The Town of Schroepfel has the most policies in-force (59), while the Town of West Monroe has the largest insurance amounts in-force (\$8,906,800).

Table 8.2 (Appendix A of the main body of the Plan) summarizes the number of flood loss claims filed to date in each jurisdiction and payments associated with losses from January 1, 1978 to July 31, 2018. NFIP Loss Statistics indicate that the Village of Cleveland has experienced the most flood losses (33), while the Town of Minetto has sustained the most total damage (\$394,973.14) even though it only had three closed losses. A number of municipalities have not reported any loss claims since this information started to be collected in 1978, including the Towns of Amboy, Boylston, Hannibal, Orwell, Palermo, Redfield, and Williamstown, and the Villages of Hannibal, Lacona, Sandy Creek, and Parish. As mentioned above, The Towns of Palermo and Williamstown do not participate in the NFIP and therefore have no claims data available.

According to FEMA, there are a total of 10 repetitive loss properties in Oswego County as of October 31, 2017 (Table 8.3, Appendix A of the main body of the Plan). Nine of these properties are single-family residential homes and one is a non-residential property. Collectively, these properties have incurred a total of 28 flood losses with total payments of \$518,807.84- an average payment of \$18,529 per loss. One of the nine single-family residences is a severe repetitive loss property and has incurred a total of six losses.

7.0 Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

Oswego County proposed 22 mitigation actions in the 2012 Oswego County HMP. The details and status of those actions are described in Table 4, below. This table is an abbreviated version of Table 7.1 in Appendix A of the main body of the Plan. The County has completed or made progress on a number of hazard mitigation-related projects in recent years.

Table 4. 2012 Hazard Mitigation Actions Oswego County						
2012 Mitigation Actions	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status	Status Notes	Re-Included In HMP Update
Alert community of locations of shelters and procedures during emergency events	All hazards	1-d	County EMO, County Office of Public Information	Ongoing	This is an ongoing, general function of the County's EMS department.	No
Enhance current tree removal program executed by National Grid	Utility Failure	3-b, 3-c, 4-b	National Grid, Town and Village Planning Boards (lead)	No Action	No action to date. County does not have input on any clearing program executed by private utility companies.	Yes
Review/implement County regulations and insurance regulations on floodplain management requirements	Flood	1-b, 3-a, 4-a, 4-b, 4-d	Oswego County Planning and all municipalities	Ongoing	This is an ongoing task completed by the County Planning Dept.	No
Provide training on NY Alert system	All hazards	1-c	County EMO	No Action	No action to date.	No
Review current agreement for County to access/service private roads – enhance as needed	Severe storm, ice storm, flood, wildfire, winter storm	1-c, 5-e	Private landowners (lead), Municipal Highway/DPW depts.	No Action	No action to date- determined to be unfeasible. The County does not have agreements in place to serve private roads.	No
Inform private road residents of current access/service agreement within County	Severe storm, ice storm, flood, wildfire, winter storm	1-c, 5-e	Municipal DPW/Highway	No Action	No action to date- determined to be unfeasible. The County does not have agreements in place to serve private roads.	No
Provide maintenance for historic lighthouse in Oswego – reinforce break wall	Severe storm, Flood	4-d, 4-e	County Community Development, USACE, City Oswego	In Progress	In progress. The foundation of the lighthouse is owned by the USACE, and structures above are owned by the City of Oswego. The County is not involved with the breakwalls. USACE recently reinforced one breakwall in Oswego but not the one at the lighthouse. Any improvements to the lighthouse breakwall would have to be undertaken directly by the USACE.	No

Table 4. 2012 Hazard Mitigation Actions
Oswego County

2012 Mitigation Actions	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status	Status Notes	Re-Included In HMP Update
Coordinate with NYS Flood Mitigation Group regarding repetitious flooding issues within Oswego County	Flood	4-d	County EMO (lead), municipal floodplain administrators	Ongoing	This is an ongoing action completed by the County EMO.	No
Coordinate with US Army Corps regarding ways to reduce Oneida Lake flooding issues affected by Barge Canal system	Flood	4-d	County EMO, FEMA, NYSOEM, Canal Corps	Ongoing	Ongoing action- County coordinates with USACE and NYS Canal Corp.	No
Educate public on Hyper-reach capabilities and uses	All hazards	1-c, 1-d, 5-b	County EMO, E911, County Promotion and Tourism Dept.	Ongoing	This is an ongoing action that could benefit from more attention. Many residents are no longer using land-line phones, and cell phone numbers are not automatically enrolled in the Hyper-Reach Program.	Yes
Inventory County and municipal equipment availability	All hazards	2-a	County EMO, County Office of Fire Coordinator, Municipal DPWs and Highway Depts.	Ongoing	This is an ongoing action that is completed by each County department individually.	No
Continue work to increase availability of broadband throughout County to improve communications	All hazards	5-c	County Planning Dept. (lead), utility companies	Ongoing	This is an ongoing action, but is led by private utility companies. Spectrum and Frontier have expanded their services throughout the County and worked with the County Planning Dept. in the process.	No
Continue to inventory aging transportation infrastructure within County	Ice storm, flood, ice jam, hazmat (in transit)	5-f	County DPW and Highway (lead), NYSDOT, Town/Village Highway/DPW	Ongoing	This is an ongoing action that is completed by each County department individually.	No
Coordinate with NYS Thruway regarding ways to distribute hazard event information to Thruway travelers	All hazards	5-c	County EMO, NYSOEM, Thruway Authority, NYSDOT	Complete	The NYSDOT completed this action- message boards are now located along the NYS Thruway and Interstate 81.	No
Review response plan of communities located within Hancock flight paths – revise as needed	All hazards	5-e	Municipal Boards, FAA, County EMO and emergency response (lead)	No Action	This was a concern in 2012 for Oneida Lake communities. No action has been completed to date.	No
Continue EEE spraying program in County as needed – evaluate program effectiveness on an annual basis.	Epidemic	5-e	County DOH	Ongoing	This is an ongoing action that is completed annually by the County Health Dept.	No

Table 4. 2012 Hazard Mitigation Actions
Oswego County

2012 Mitigation Actions	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status	Status Notes	Re-Included In HMP Update
Implement aid and liability agreements with local ATV clubs to assist during emergencies	All hazards	2-c	Municipal Boards, ATV clubs	No Action	This action is not feasible for the County to complete- agreements regarding aid to local emergency responders would be made between the clubs and respective local municipalities. The County Planning Dept. works with ATV and snowmobile clubs regarding access and maintenance along trails.	No
Implement aid and liability agreements with local HAM operators to assist during emergencies	All hazards	2-c	County EMO, RACES, local operators groups	Ongoing	This is an ongoing action, though there is no formal agreement in place between the County and local HAM operators. The operators tend to be ready on an as-needed basis.	No
Add additional emergency response trailers along I-81 corridor	All hazards	3-d	County Office Fire Coordinator., NYSDOT	Complete	This action was completed in 2015. NYSDOT traffic trailers were set up along Interstate 81. The trailers have equipment to use during hazard events requiring road closures.	No
Improve cell phone reception and GPS function within County	All hazards	5-c	Phone companies, County legislature	Ongoing	This is an ongoing action as telecommunication utility companies continue to expand and improve service throughout the County.	No
Review emergency evacuation signage within I-81 corridor communities – establish such signage if needed	Severe storm, ice storm, earthquake, tornado, flood, wildfire, winter storm, coastal storm, landslide, terrorism, hazmat (transit)	5-c, 5-e	County EMO, Municipal Boards and Highway/DPW, NYSDOT	Ongoing	While the NYSDOT established emergency signage along Interstate 81 since the 2012 HMP was completed, signage is still lacking on main roadways throughout the County that connect to I-81. The County has established sign layouts, detour routes and plans to have an emergency evacuation plan approved and in place by Winter 2019.	No
Develop database of special needs and elderly individuals within County and a system to contact them in case of emergency – update database annually	All hazards	5-b	County DOH, County Office for the Aging (lead)	Ongoing	This action, as written in 2012, was determined to not be feasible at the County level. The County does not have sufficient funding or staff to complete this. The County revised this action to include in the HMP update.	Yes

7.2 Proposed Mitigation Actions

The County proposed eleven new mitigation actions to be included in the HMP update. These actions are described in Table 5, below and on worksheets included in Attachment A. This table is equivalent to Table 7.2 in Appendix A of the main body of the Plan.

Table 5. 2018 Proposed Mitigation Actions Oswego County									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Oswego County 1	Acquire a generator for the Parish and Pulaski County Highway Garages	Severe Thunderstorm/ Wind/Tornado, Utility Failure	County Highway Dept*	County Capital Improvement Plan	2 years	Existing	\$175,000	FEMA- PDM	1 (High)
Oswego County 2	Acquire generators for the Oswego County Airport to power office building, runway lights, gates, and fuel pumps	Severe Thunderstorm/ Wind/ Tornado, Utility Failure	County Highway Dept*, Oswego County Airport	County Capital Improvement Plan	2 years	Existing	\$125,000	FEMA- PDM	2 (High)
Oswego County 3	Oswego County Airport flood mitigation project	Flood	County Highway Dept*, Oswego County Airport	County Capital Improvement Plan	2 years	Existing	\$1.2 million	FEMA- PDM	3 (Medium)
Oswego County 4	Research methods to develop database of contact info/develop formal plan for agency coordination to contact vulnerable individuals (elderly, special needs) during emergencies.	All	County EMO*, County Health Dept, County Office for the Aging	Emergency Response Plan	1 year, update annually	N/A	Low	County Budget	4 (Medium)
Oswego County 5	Increase public awareness of Hyper-Reach Program and encourage residents to opt-in to the program with their cell phone numbers. This will increase the number of people notified during a hazard event.	All	County EMO*, E-911, County Promotion and Tourism	Emergency Response Plan	1 year	N/A	Low	County Budget	5 (Medium)

Table 5. 2018 Proposed Mitigation Actions
Oswego County

Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Oswego County 6	County Highway Dept.to identify hot spot areas for tree clearing/maintenance and communicate with private utility companies.	Ice Storm, Severe Storm, Severe Winter Storm	County Highway Dept*	County Capital Improvement Plan	2 years	Existing	Medium	County Budget	6 (Medium)
Oswego County 7	Acquire a generator for the Oswego County Department of Social Services	Severe Thunderstorm /Wind/Tornado, Utility Failure	County Dept. of Social Services*	County Capital Improvement Plan	2 years	Existing	\$100,000	FEMA- PDM	7 (Medium)
Oswego County 8	Develop an Emerald Ash Borer Management Plan	Infestation	County EMO*, Oswego County SWCD	County Capital Improvement Plan	2 years	N/A	\$20,000	County Budget	8 (Low)
Oswego County 9	Public sewer system for Sandy Pond properties	Flood	County EMO*, Town of Sandy Creek Supervisor	County Capital Improvement Plan	1-2 years	Existing	\$12 million or more	FEMA- PDM; NYSEFC-CWSRF; USDA-RD	9 (Low)
Oswego County 10	Continue EEE mosquito monitoring program in County as needed.	Epidemic	Oswego County Health Dept.*	County Capital Improvement Plan	1 year	N/A	High	County Budget	10 (Low)

Table 5. 2018 Proposed Mitigation Actions
Oswego County

Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Oswego County 11	Develop property resilience brochure and provide to all jurisdictions for local input and distribution.	Severe Thunderstorm/Wind/Tornado, Flooding, Severe Winter Storm, Ice Storm	County EMO*	Emergency Response Plan	6 months	Existing	\$1,000	County Budget	11 (Medium)
<p>Potential Funding Sources</p> <p>FEMA PDM: https://www.fema.gov/pre-disaster-mitigation-grant-program</p> <p>USDA-RD Water & Waste Disposal Loan & Grant Program: https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ny</p> <p>NYSEFC CWSRF: https://www.efc.ny.gov/CWSRF</p>									

7.3 *Cost-Benefit Analysis*

Each of the County's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis. The County's STAPLEE worksheet is provided in Attachment B. The STAPLEE analysis includes the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental.

8.0 **Works Cited**

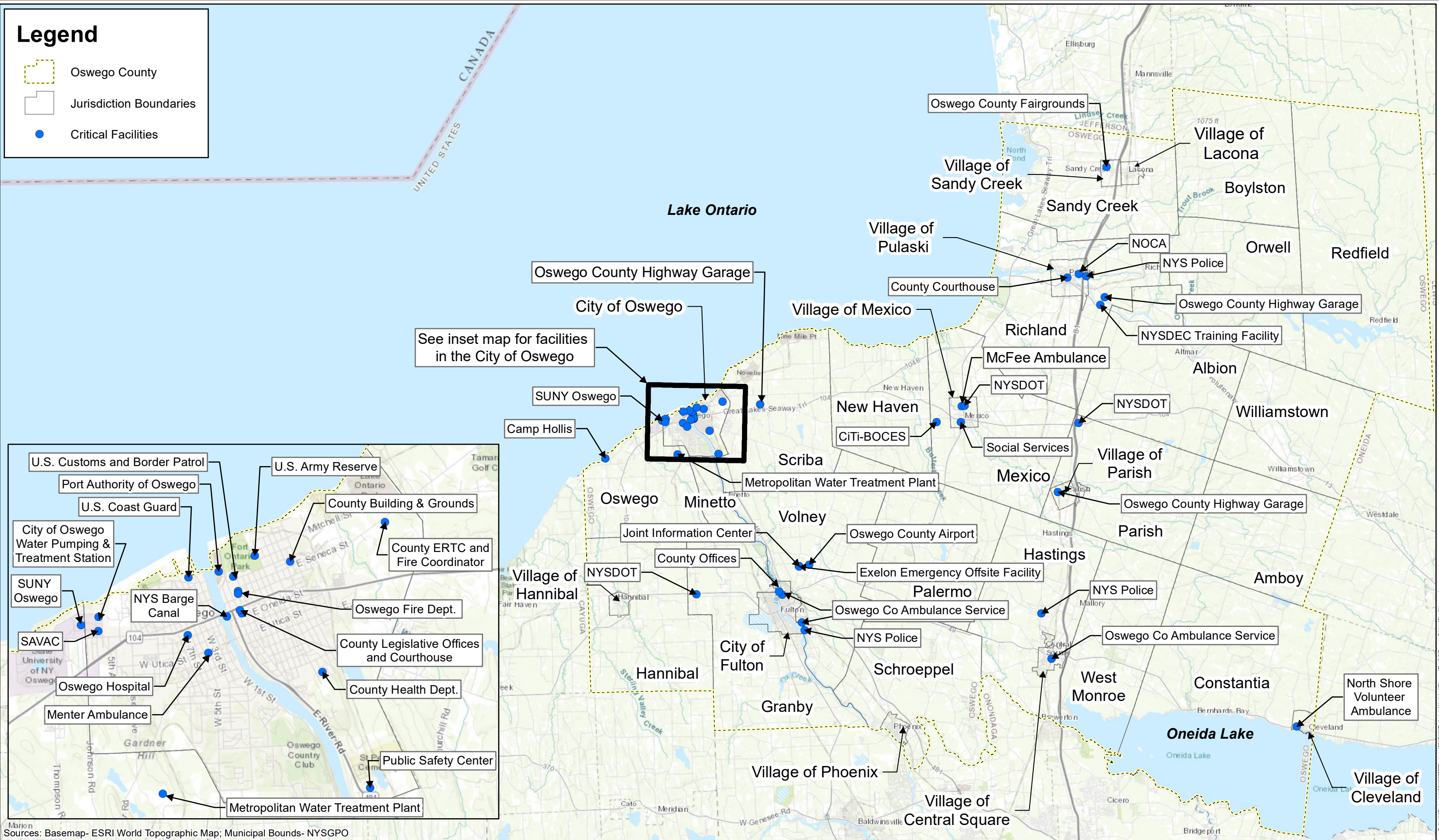
- White, Justin. 2016. "Oswego County: A Proud History of 200 Years". History of Oswego County, New York, Marking the Bicentennial. Eds Shawn Doyle, Roy Reehil, Debra Allen, Justin White, Janet Clerkin, Kelly Jordal, and Kara Alheim. Oswego, NY: Oswego County, New York, 2016. 13-21. Print.
- U.S. Census Bureau. 2016. "Summary File." 2012 – 2016 American Community Survey. U.S. Census Bureau's American Community Survey Office, 2016. Web. Accessed 5 September 2018. Available from:
<https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

Figure 1

**Hazard Area Extent and Location Map –
Oswego County**

Legend

- Oswego County
- Jurisdiction Boundaries
- Critical Facilities



U.S. Customs and Border Patrol

Port Authority of Oswego

U.S. Coast Guard

City of Oswego Water Pumping & Treatment Station

SUNY Oswego

SAVAC

Oswego Hospital

Menter Ambulance

Gardner Hill

Johnson Rd

Thompson Rd

W 5th St

W 7th St

W 1st St

E Onondaga St

E Seneca St

County Building & Grounds

County ERTC and Fire Coordinator

Oswego Fire Dept.

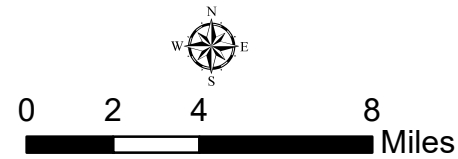
County Legislative Offices and Courthouse

County Health Dept.

Public Safety Center

Metropolitan Water Treatment Plant

Sources: Basemap- ESRI World Topographic Map; Municipal Bounds- NYSGPO



Oswego County

County Critical Facilities

Oswego County October 2018 New York

Figure

Project No. 132.237

Attachment A

**Mitigation Action Worksheets –
Oswego County**

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Acquire a generator for the Parish and Pulaski County Highway Garages.
Project Number:	Oswego County 1
Risk/Vulnerability	
Hazard of Concern:	Severe Thunderstorm/Wind/Tornado, Utility Failure
Description of the Problem:	The county highway garages provide fuel and other services for county and emergency response vehicles in the northern and eastern parts of the county. The Parish garage serves as a Personnel Monitoring Center during a radiological emergency. Two garages – Parish and Pulaski – have no alternate sources of power and would be unable to operate during a power outage. This would severely impact the ability of County Highway as well as Fire, Law Enforcement and other emergency services to respond to hazards during the emergency. While the Scriba facility has a generator, its location on the other side of the county would create a hardship for first responders.
Action of Project Intended for Implementation	
Description of the Solution:	The purchase and installation of generators at the Pulaski and Parish highway garages would allow those facilities to continue servicing emergency response vehicles during a power outage.

Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	The availability of generators at these facilities would prevent additional losses and damages from the hazard causing the power outage.
Useful Life:	Long-Term- 30 years		
Estimated Cost:	Parish garage – \$75,000 Pulaski garage - \$100,000		

Plan for Implementation			
Prioritization:	High (#1)	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	6 months	Potential Funding Sources:	FEMA- PDM, County Budget
Responsible Organization:	County Highway Department	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	County Highway Garages risk loss of power.
	Electrical switches for generator hookup at Pulaski and Parish garages	\$40,000	This would require contracts with generator suppliers whose services would already be in demand. Securing a generator and hooking it up will take time away from emergency response.
	Purchase generators for the Parish and Pulaski County Highway Garages	\$175,000	Maximum benefit and least risk to continuity of emergency operations.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Acquire generators for the Oswego County Airport to power office building, runway lights, gates, and fuel pumps
Project Number:	Oswego County 2
Risk/Vulnerability	
Hazard of Concern:	Severe Thunderstorm/Wind/Tornado, Utility Failure
Description of the Problem:	The Oswego County Airport is a critical facility for air transportation. Its traffic is 20,550 takeoffs and landings annually, and it serves as an air transportation hub for several public safety agencies including Coast Guard, New York State Police and Border Patrol. It also serves as a staging area for critical equipment for the Nine Mile Point nuclear power plants in an emergency, for buses to be used in evacuation in a nuclear power plant emergency, and for medical supply during a public health emergency. It also provides fuel for county vehicles and during emergencies for Fire, Law Enforcement and other emergency services. A power outage would prevent the airport from providing support to these essential emergency services.
Action of Project Intended for Implementation	
Description of the Solution:	The purchase and installation of generators at the county airport to power the office building, runway lights, gates and fuel pumps will allow the airport to continue providing emergency support during a power outage.

Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	The availability of generators at these facilities would prevent additional losses and damages from the hazard causing the power outage.
Useful Life:	30 years		
Estimated Cost:	\$125,000		

Plan for Implementation			
Prioritization:	High (#2)	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA- PDM, County Budget (capital projects fund)
Responsible Organization:	Oswego County Highway Dept. and Oswego County Airport	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Airport risks power outage during emergencies.
	Electrical switches for generator hookup at the airport	\$20,000	This would require contracts with generator suppliers whose services would already be in demand. Securing a generator and hooking it up will take time away from emergency response.
	Acquire generators for Airport.	\$125,000	Best solution to preserve continuity of operations at the airport during an emergency.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Oswego County Airport flood mitigation project
Project Number:	Oswego County 3
Risk/Vulnerability	
Hazard of Concern:	Severe Thunderstorm/Wind/Tornado, Utility Failure
Description of the Problem:	The Oswego County Airport is a critical facility for air transportation. Its traffic is 20,550 takeoffs and landings annually, and it serves as an air transportation hub for several public safety agencies including Coast Guard, New York State Police and Border Patrol. It also serves as a staging area for critical equipment for the Nine Mile Point nuclear power plants in an emergency, for buses to be used in evacuation in a nuclear power plant emergency, and for medical supply during a public health emergency. The area surrounding Runway 33 near County Route 176 that runs past the airport floods 3 to 4 times per year during heavy rain events and snowmelt. The water pools in a holding pond that floods and threatens the runway itself. Water runs through a culvert under the runway and into two culverts that carry the water under Route 176, flooding the yards of three houses on the other side of Route 176 and threatening the houses themselves.
Action of Project Intended for Implementation	
Description of the Solution:	Construction of a larger culvert under the runway, rebuild of the two culverts under Route 176, and enhancement of a holding area on airport property near Route 176 into a retention pond will maintain flow and direct floodwater away from the runway and homes.

Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Avoid future flood-related damages to three homes and the county's runway.
Useful Life:	50 years		
Estimated Cost:	\$1.2 million		

Plan for Implementation			
Prioritization:	Medium (#3)	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	FEMA- PDM, County Budget (capital projects fund)
Responsible Organization:	Oswego County Highway Dept. and Oswego County Airport	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Flood potential could worsen with increasing rain events
	Temporarily restricting flow of culverts under Route 176	\$1,000	This action will help keep some flooding from occurring on properties across Route 176 but will not address the potential for runway flooding
	Flood mitigation project	\$1.2 million	Most comprehensive solution for airport and nearby properties.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Research methods to develop database of contact info/develop formal plan for agency coordination to contact vulnerable individuals (elderly, special needs) during emergencies.
Project Number:	Oswego County 4
Risk/Vulnerability	
Hazard of Concern:	All
Description of the Problem:	The County does not have a current database for residents who may require help during emergencies (people with special needs, elderly, etc.). The County included the creation of such a database in their 2012 HMP, but there is not an efficient protocol in place for keeping it up to date. More information is needed regarding potential options and to set up a plan for coordination among multiple agencies.
Action of Project Intended for Implementation	
Description of the Solution:	The County plans to research methods available for database creation of vulnerable residents, and develop a formal plan for agency coordination to contact individuals during emergencies.

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Better protection of vulnerable residents during emergency events.
Useful Life:	Short-term- needs regular updating		
Estimated Cost:	Low		

Plan for Implementation			
Prioritization:	Medium (#4)	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	1 year, update annually	Potential Funding Sources:	FEMA- PDM, County Budget
Responsible Organization:	Oswego County EMO*, County Health Dept, County Office for the Aging	Local Planning Mechanisms to be used in Implementation, if any:	Emergency Response Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Lack means of contacting vulnerable residents
	Coordinate with other agencies (Oswego County Opportunities, Meals on Wheels, etc.) to contact vulnerable individuals	Low	Partial solution but lacks efficiency and individuals to be contacted may be missed.
	Research database options and develop coordination plan to streamline communication	Low	Most efficient solution- a set plan will streamline communication process. Multiple agencies will still be involved.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Increase public awareness of Hyper-Reach Program and encourage residents to opt-in to the program with their cell phone numbers. This will increase the number of people notified during a hazard event.
Project Number:	Oswego County 5
Risk/Vulnerability	
Hazard of Concern:	All
Description of the Problem:	Oswego County uses the Hyper-Reach Program to notify residents during emergency situations. Landline phones are automatically opted-in for notification through this program, however, residents must manually opt-in for the program to notify them on a cell phone. Many residents rely solely on their cell phones and no longer have a landline phone.
Action of Project Intended for Implementation	
Description of the Solution:	Increase public awareness throughout the County for residents to opt-in with their cell phone numbers. This will result in better public notification during emergencies.

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Better informed and prepared public, reduction in injuries and loss of life.
Useful Life:	Short-Term		
Estimated Cost:	Low		

Plan for Implementation			
Prioritization:	Medium (#5)	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Project Implementation:	6 months	Potential Funding Sources:	County Budget
Responsible Organization:	County EMO*, E-911, County Promotion and Tourism	Local Planning Mechanisms to be used in Implementation, if any:	Emergency Response Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Many residents still uninformed during emergencies.
	Door-to- door notification of residents	Low but time consuming	Not practical for County-wide emergencies.
	Encourage residents to use Hyper-Reach and add cell phone numbers for notification.	Low	Best way to reach most residents that do not have a landline phone.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	County Highway Dept. to identify hot spot areas for tree clearing/maintenance and communicate with private utility companies.
Project Number:	Oswego County 6
Risk/Vulnerability	
Hazard of Concern:	Ice Storm, Severe Storm, Severe Winter Storm
Description of the Problem:	Currently, roadside tree maintenance is completed by private utility companies (typically annually) as well as the County Highway Department and municipal highway departments. Hazardous trees that could cause damages to properties or infrastructure if they were to fall during a storm event may be missed by utility companies.
Action of Project Intended for Implementation	
Description of the Solution:	The County Highway Department could identify high-priority trees to be cleared/areas to maintain and communicate with private utility companies to ensure these areas are addressed.

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Avoid property damages due to fallen trees/limbs during severe storm events.
Useful Life:	Short-Term		
Estimated Cost:	Low		

Plan for Implementation			
Prioritization:	Medium (#6)	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	6 months	Potential Funding Sources:	County Budget
Responsible Organization:	Oswego County Highway Dept.	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Flood potential could worsen with increasing rain events
	Allow private utility companies to prioritize/complete all maintenance	\$0	Potentially hazardous areas could be missed, or new hazards could develop after private companies already complete annual maintenance.
	County Highway Dept to identify hazardous areas and communicate with utility companies to ensure they are addressed.	Low	Better protection of infrastructure and properties.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Public sewer system for Sandy Pond properties
Project Number:	Oswego County 9
Risk/Vulnerability	
Hazard of Concern:	Flood (specifically Sandy Pond)
Description of the Problem:	Flooding along the Lake Ontario shoreline and within Sandy Pond threatens existing septic systems for homes and businesses in the area. The 2017 Lake Ontario flooding and high water created conditions that rendered septic systems unusable for much of the summer. Loss of these systems can create significant financial hardships for property owners.
Action of Project Intended for Implementation	
Description of the Solution:	Construct public sewer system to serve properties within the Greene Point Marina area. Public sewers would eliminate the use of on-site septic systems and potential flooding issues with those systems.

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Viability of homes and businesses, including Green Point Marina, would be maintained
Useful Life:	100 years		
Estimated Cost:	\$12 million + (depending on project scope)		

Plan for Implementation			
Prioritization:	Low (#9)	Desired Timeframe for Implementation:	1-2 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	FEMA- PDM; NYSEFC CWSRF; USDA-RD- Water & Waste Disposal Loan & Grant Program
Responsible Organization:	Oswego County EMO*	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change in flooding concerns along Sandy Pond.
	Protection of septic systems by property owners	Unknown	Not feasible for many property owners, and would not provide reliable protection for future flooding events
	Construct sanitary sewer system	\$12 million + (depending on scope of service area within Town of Sandy Creek)	Reliable sanitary sewage treatment for residents, infrastructure would not be subject to impacts from flooding.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Develop an Emerald Ash Borer Management Plan
Project Number:	Oswego County 8
Risk/Vulnerability	
Hazard of Concern:	Infestation
Description of the Problem:	The emerald ash borer was documented in the southern part of Oswego County in 2017 and in the Town of Sandy Creek in 2018. This species is expected to spread throughout the entire County. The ash borer can kill a mature ash tree in less than 2 years, after which the trees can fall at any time and pose significant hazards related to public safety, property damage, and power outages. The Oswego County Soil and Water Conservation District recommends that the county develop a plan in order to implement a proactive approach to managing emerald ash borer infestations and prevent damages in susceptible areas.
Action of Project Intended for Implementation	
Description of the Solution:	Encourage the County to work with the Oswego County Soil and Water Conservation District to develop a management plan to inventory existing ash trees on County properties and rights of way, and to document existing EAB infestations. The plan would include protocol for both proactive and reactive measures to address EAB infestations and existing ash stands.

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Moderate	Estimated Benefits (losses avoided):	Reduce number of injuries, property damages, and power outages associated with downed trees or limbs.
Useful Life:	5 years		
Estimated Cost:	\$20,000		

Plan for Implementation			
Prioritization:	Low (#8)	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	County Budget
Responsible Organization:	Oswego County EMO*, Oswego County SWCD	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change. Hazards related to EAB increase.
	Reactive approach only	\$10,000+	No proactive management measures
	Develop management plan	\$20,000	More comprehensive approach, County will be more readily able to address potential hazardous areas before they become a public safety concern

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	

Update Evaluation of the Problem and/or Solution:	
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Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Acquire a generator for the Oswego County Department of Social Services.
Project Number:	Oswego County 7
Risk/Vulnerability	
Hazard of Concern:	Severe Thunderstorm/Wind/Tornado, Utility Failure
Description of the Problem:	The Oswego County Department of Social Services is located in the Village of Mexico and provides essential services for low income individuals and families and people with special needs. The Department of Social Services has no alternate source of power and would be unable to operate during a power outage. This would severely impact the ability of the County to continue services for vulnerable populations during emergencies.
Action of Project Intended for Implementation	
Description of the Solution:	The purchase and installation of a generator at the Department of Social Services would allow the facilities to continue serving vulnerable populations during a power outage.

Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	The availability of generators at this facility would prevent additional losses and damages from the hazard causing the power outage by allowing the County to continue to assist vulnerable populations during emergencies.
Useful Life:	Long-Term- 30 years		
Estimated Cost:	\$100,000		

Plan for Implementation			
Prioritization:	Medium (#7)	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	6 months	Potential Funding Sources:	FEMA- PDM, County Budget
Responsible Organization:	County Department of Social Services	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	County Department of Social Services risks loss of power.
	Install electrical switches for generator hookup at Department of Social Services	\$20,000	This would require contracts with generator suppliers whose services would already be in demand. Securing a generator and hooking it up will take time away from emergency response.
	Purchase generator for the County Department of Social Services	\$100,000	Maximum benefit and least risk to continuity of services for vulnerable populations in the County during an emergency.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Continue EEE mosquito monitoring program in County as needed.
Project Number:	Oswego County 10
Risk/Vulnerability	
Hazard of Concern:	Endemic
Description of the Problem:	Mosquito-borne viruses such as Eastern Equine Encephalitis (EEE) present a significant concern for portions of Oswego County located near Oneida Lake (particularly Toad Harbor swamp in the Towns of Hastings, West Monroe, and Constantia). Mosquitoes from Toad Harbor tested positive for EEE in past years. The Oswego County Health Department conducts mosquito monitoring in Toad Harbor and nearby locations annually.
Action of Project Intended for Implementation	
Description of the Solution:	Continue annual mosquito monitoring program to decrease the mosquito population in Toad Harbor. Re-evaluate frequency and need annually based on EEE testing results.

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Conducting annual mosquito monitor reduces the mosquito population and therefore reduces the risk of EEE or West Nile Virus infections to humans or animals in Oswego County.
Useful Life:	Short-Term, 1 year		
Estimated Cost:	High		

Plan for Implementation			
Prioritization:	Medium (#10)	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Project Implementation:	2 months	Potential Funding Sources:	County Budget
Responsible Organization:	County Health Department	Local Planning Mechanisms to be used in Implementation, if any:	County Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change in current conditions.
	Provide resources to County residents regarding mosquito borne illnesses and how they can reduce their risks	Low	Residents can take precautionary measures but ultimately this will not reduce the mosquito population of concern.
	Continue annual mosquito monitoring	High	Provides information for direct control of mosquito population and EEE virus activities o reduce risks in the area, when needed.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Oswego County Multi-Jurisdictional Hazard Mitigation Plan

Name of Jurisdiction:	Oswego County
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Mitigation Action Worksheet	
Project Name:	Develop property resilience brochure and provide to all jurisdictions for local input and distribution.
Project Number:	Oswego County 11
Risk/Vulnerability	
Hazard of Concern:	Severe Thunderstorm/Wind/Tornado, Flooding, Severe Winter Storm, Ice Storm
Description of the Problem:	Many residents throughout Oswego County may lack knowledge regarding how to make their properties more resilient to flooding and storm events. Storm damages could be minimized or avoided if residents had access to practical methods for hardening their properties.
Action of Project Intended for Implementation	
Description of the Solution:	Develop a County-wide property resiliency brochure detailing different methods that County residents can use to make their properties more resilient to severe storms and flooding. Distribute the brochure to each jurisdiction within the County for local input (specific codes, contacts, etc.) and distribution to their residents.

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	County residents would be better informed about ways to protect their properties during flooding and storm events, which would help to lessen property damages in the future.
Useful Life:	Long-term		
Estimated Cost:	\$1,000		

Plan for Implementation			
Prioritization:	Medium (#11)	Desired Timeframe for Implementation:	6 months
Estimated Time Required for Project Implementation:	3 months	Potential Funding Sources:	County budget
Responsible Organization:	Oswego County EMO*	Local Planning Mechanisms to be used in Implementation, if any:	Emergency Response Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change in public awareness regarding property resilience.
	Distribute County brochure to all county residents without including jurisdiction-specific modifications	\$2,000	Partial solution. The property resiliency techniques likely would be the same as those identified for the County, but this option lacks Town-specific information.
	Distribute County brochure to jurisdictions for addition of local information and distribution	\$1,000	Most comprehensive approach, gives Town residents more complete information regarding Town-specific codes and contacts.

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Attachment B

**STAPLEE Table –
Oswego County**

STAPLEE Criteria Consideration Table
Mitigation Action Prioritization and Comparison

Jurisdiction Oswego County

Action ID	Action													
		S	T	A	P	L	E	E	Can action be easily implemented?	Does action achieve multiple plan objectives?	Can action be quickly implemented?	Level of action benefits	Level of action overall costs	Priority ranking
		+ = Benefit (favorable), - = Cost (unfavorable), 0 = Neutral or N/A										Levels = High, Medium, or Low		
Oswego County 1	Acquire a generator for the Parish and Pulaski County Highway Garages	+	+	+	+	+	-	0	+	+	+	High	High	High (#1)
Oswego County 2	Acquire a generator for the Oswego County Airport	+	+	+	+	+	-	0	+	+	+	High	High	High (#2)
Oswego County 3	Oswego County Airport flood mitigation project	+	+	+	+	+	-	0	+	+	+	High	High	Med (#3)
Oswego County 4	Research methods to develop database of contact info/develop formal plan for agency coordination to contact vulnerable individuals (elderly, special needs) during emergencies.	+	+	+	+	+	0	0	+	+	0	Medium	Low	Med (#4)
Oswego County 5	Increase public awareness of Hyper-Reach Program and encourage residents to opt-in to the program with their cell phone numbers. This will increase the number of people notified during a hazard event.	+	+	+	+	+	0	0	+	+	+	Medium	Low	Med (#5)
Oswego County 6	County Highway Dept. to identify hot spot areas for tree clearing/maintenance and communicate with private utility companies.	+	+	+	+	+	0	0	+	+	0	Medium	Low	Med (#6)
Oswego County 7	Acquire a generator for the Oswego County Department of Social Services.	+	+	+	+	+	-	0	+	+	+	High	High	Med (#7)
Oswego County 8	Develop an Emerald Ash Borer Management Plan	+	+	-	+	+	0	+	+	+	+	Medium	Medium	Low (#8)
Oswego County 9	Public sewer system for Sandy Pond properties	+	+	-	+	+	-	+	-	+	-	High	High	Low (#9)
Oswego County 10	Continue EEE monitoring program in County as needed.	+	+	+	+	+	-	+	+	+	+	Medium	Low	Low (#10)
Oswego County 11	Develop property resilience brochure and provide to all jurisdictions for local input and distribution.	+	+	+	+	+	+	0	+	+	+	Medium	Low	Med (#11)