Discovery Report

Oneida Lake Watershed

HUC 04140202

Lewis, Madison, Oneida, Onondaga, and Oswego Counties, New York*

These counties span more than one watershed; please see the following page for a list of communities fully or partially located in the watershed. This report covers only the Oneida Lake Watershed in the State of New York.

September 14, 2016

FEMA

Federal Emergency Management Agency
Department of Homeland Security
26 Federal Plaza
New York, NY

Project Area Community List

This list includes all communities located fully or partially within the Oneida Lake Watershed. While all communities may be under consideration for a revised Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM), not all communities will receive new/updated FEMA FISs or FIRMs as a result of this watershed Discovery project.

Lewis County
- Lewis, Town of *
- Martinsburg, Town of *
- Montague, Town of *
- Osceola, Town of *
- West Turin, Town of *
- *Turin, Town of ***

Madison County
- Canastota, Village of
- Cazenovia, Town of *
- Cazenovia, Village of
- Chittenango, Village of
- De Ruyter, Town of *
- Eaton, Town of *
- Fenner, Town of
- Lenox, Town of
- Lincoln, Town of
- Munnsville, Village of
- Nelson, Town of *
- Oneida, City of
- Smithfield, Town of *
- Stockbridge, Town of *
- Sullivan, Town of
- Wampsville, Village of

Oneida County
- Annsville, Town of
- Augusta, Town of *
- Ava, Town of *
- Camden, Town of
- Camden, Village of
- Florence, Town of *
- Lee, Town of *
- Oneida Castle, Village of
- Rome, City of *
- Sherrill, City of
- Sylvan Beach, Village of
- Vernon, Town of *
- Vernon, Village of
- Verona, Town of

Oneida County (continued)
- Vienna, Town of
- Westmoreland, Town of *
- *Western, Town of ***

Onondaga County
- Cicero, Town of *
- Clay, Town of *
- Dewitt, Town of *
- East Syracuse, Village of *
- Fabius, Town of *
- Fayetteville, Village of
- Lafayette, Town of *
- Manlius, Town of *
- Manlius, Village of
- Minoa, Village of
- North Syracuse, Village of *
- Pompey, Town of *
- Salina, Town of *
- Syracuse, City of *
- *Cuyler, Town of ***
- *Onondaga, Town of ***
- *Preble, Town of ***
- *Tully, Town of ***
- *Truxton, Town of ***

Oswego County
- Amboy, Town of *
- Central Square, Village of
- Cleveland, Village of
- Constantia, Town of
- Hastings, Town of *
- Palermo, Town of *
- Parish, Town of *
- Redfield, Town of *
- Schroeppel, Town of *
- *Albion, Town of ***
- *Orwell, Town of ***
- *Phoenix, Village of ***

*Partially within the Oneida Lake Watershed

***Partially within the Oneida Lake Watershed, but not included in this Discovery Report due to inclusion within other Discovery processes, lack of flooding sources, and/or unpopulated area or development.*

Study Date

The information and data presented in this report are static and were current as September 2016. The Discovery process for the Oneida Lake Watershed began in early 2016. Data collection was completed between March and May 2016. The in-person Discovery Meetings were held in May 2016. Additional details on meetings and stakeholder involvement can be found in Sections IV and V of this report. As applicable, dates of data creation are noted throughout the report.

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Acronyms and Abbreviations

AAL	Average Annualized Loss
BFE	Base Flood Elevation
CAC	Community Assistance Contact
CAV	Community Assistance Visit
CFR	Code of Federal Regulations
CID	Community Identification Number
CIS	Community Information System
CNMS	Coordinated Needs Management Strategy
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FIPS	Federal Information Processing Standard
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
Hazus-MH	Multi-Hazard Risk Assessment and Loss Estimation Software Program
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HWM	High Water Mark
HUC	Hydrologic Unit Code
LiDAR	Light Detection and Ranging
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on Fill
MS4	Municipal Separate Storm Sewer System
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resources Conservation Service
NWS	National Weather Service
NYSDEC	New York State Department of Environmental Conservation

NYSDHSES	New York State Division of Homeland Security and Emergency Services
PDM	Pre-Disaster Mitigation
Risk MAP	Risk Mapping, Assessment, and Planning
RL	Repetitive Loss
SFHA	Special Flood Hazard Area
SPDES	State Pollutant Discharge Elimination System
SRL	Severe Repetitive Loss
SWCD	Soil and Water Conservation District
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey

Glossary of Terms

1-Percent-Annual-Chance Flood: The flood having a 1-percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood" or "base flood". The base flood is the national standard used by the National Flood Insurance Program (NFIP) and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development. Base Flood Elevations (BFEs) are typically shown on Flood Insurance Rate Maps (FIRMs). (Federal Emergency Management Agency (FEMA)

0.2-Percent-Annual-Chance Flood: A flood that has a 0.2-percent chance of being equaled or exceeded in any given year (also known as a 500-year flood). (FEMA)

Approximate Study: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no BFEs or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. An approximate study is represented on a FIRM as a Zone A. (FEMA)

Average Annualized Loss (AAL): AAL is the estimated long-term value of losses to the general building stock averaged on an annual basis for a specific hazard type. Annualized loss considers all future losses for a specific hazard type resulting from possible hazard events with different magnitudes and return periods averaged on a "per year" basis. Like other loss estimates, AAL is an estimate based on available data and models. Therefore, the actual loss in any given year can be substantially higher or lower than the estimated annualized loss. (FEMA)

Base Flood Elevation (BFE): The computed elevation to which floodwater is anticipated to rise during the base flood. BFEs are shown on FIRMs and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium. (FEMA)

Coordinated Needs Management Strategy (CNMS): A FEMA Geographic Information System (GIS) tool that identifies and tracks the lifecycle of mapping requests and needs for the flood hazard mapping program. (FEMA)

Dam: An artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water. (FERC)

Declared Disaster: Local and State governments share the responsibility for protecting their citizens and for helping them recover after a disaster strikes. In some cases, disasters are beyond the capabilities of local, State, and tribal government. In 1988, the Stafford Act was enacted to support local, State and tribal governments and their citizens when disasters overwhelm and exhaust their resources. This law, as amended, established the process for requesting and obtaining a Presidential Emergency or Disaster Declaration, defined the type and scope of assistance available from the Federal Government, and set the conditions for obtaining assistance.

Steps for a Disaster Declaration include: (1) Local government responds, supplemented by neighboring communities and volunteer agencies. If the local government is overwhelmed, the (2) State responds, (3) damage assessments are completed to determine total losses and recovery needs, (4) Disaster Declaration is requested by the governor of the state or by a tribal Chief Executive Officer (CEO), based on damage assessments, (5) FEMA evaluates the request, and then the (6) President approves or denies the request. (FEMA)

Detailed Study: A flood hazard mapping study done using hydrologic and hydraulic methods that produce BFEs, floodways, and other pertinent flood data. Detailed study areas are shown on the FIRM as Zones AE, AH, AO, AR, A99, A1-A30, and in coastal areas Zones V, VE, and V1-30. (FEMA)

Flood Insurance Rate Map (FIRM): The official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. (FEMA)

Flood Insurance Study (FIS): A compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. When a flood study is completed for the NFIP, the information and maps are assembled into an FIS. The FIS report contains detailed flood elevation data in flood profiles and data tables. (FEMA)

Flood Mitigation Assistance (FMA): The FMA program provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the NFIP on an annual basis. There are three types of FMA grants available and include (1) planning grants, (2) project grants, and (3) management cost grants. (FEMA)

Multi-Hazard Risk Assessment and Loss Estimation Program (Hazus-MH): Hazus-MH is a nationally applicable standardized methodology that estimates potential losses from earthquakes, hurricane winds and floods. FEMA developed Hazus-MH under contract with the National Institute of Building Sciences (NIBS). Hazus-MH uses state-of-the-art GIS software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of earthquakes, hurricane winds and floods on populations. (FEMA)

Hazard Mitigation Assistance (HMA): FEMA's HMA grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages including the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA). (FEMA)

Hazard Mitigation Grant Program (HMGP): The HMGP provides grants to States or tribes and local governments (as sub-grantees) to implement long-term hazard mitigation measures after a major disaster declaration. Each State or tribe (if applicable) administers the HMGP in their jurisdiction. The purpose of the HMGP is to reduce the loss of life and property due to natural

disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Individual homeowners and businesses may not apply directly to the program; however, an eligible applicant or sub-applicant may apply on their behalf. (FEMA)

HUC (Hydrologic Unit Code): The United States Geological Survey (USGS) divides and sub-divides the area of the United States into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged or nested within each other, from the largest geographic area (regions) to the smallest geographic area (cataloging units). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system. (USGS)

Hydraulics: the science that deals with fluids in motion, is used to determine how a quantity of water will flow through a channel or floodplain. For purposes of floodplain analysis, hydraulics is the study of floodwaters moving through the stream and the floodplain. (FEMA)

Hydrology: The science that encompasses the occurrence, distribution, movement, and properties of the waters of the earth and their relationship to the environment within each phase of the hydrologic cycle. The water cycle, or hydrologic cycle, is a continuous process by which water is purified by evaporation and transported from the earth's surface (including the oceans) to the atmosphere and back to the land and oceans. (USGS)

Light Detection and Ranging (LiDAR**):** is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth. These light pulses— combined with other data recorded by the airborne system— generate precise, three-dimensional information about the shape of the Earth and its surface characteristics. LIDAR systems allow scientists and mapping professionals to examine both natural and manmade environments with accuracy, precision, and flexibility.
(NOAA)

Letter of Map Amendment (LOMA): A LOMA is an official amendment, by letter, to an effective NFIP map. A LOMA establishes a property's location in relation to the Special Flood Hazard Area (SFHA). LOMAs are usually issued because a property has been inadvertently identified as being in the floodplain, but is actually on natural high ground above the BFE or out as shown on the FIRM. Because a LOMA officially amends the effective National Flood Insurance Program (NFIP) map, it is a public record that the community must maintain. Any LOMA should be noted on the community's master flood map and filed by panel number in an accessible location. (FEMA)

Letter of Map Change (LOMC): LOMC is a general term used to refer to the several types of revisions and amendments to FEMA maps that can be accomplished by letter. They include

LOMAs, Letter of Map Revision (LOMR), and Letter of Map Revision based on Fill (LOMR-F). (FEMA)

Letter of Map Revision (LOMR): FEMA's modification to an effective FIRM. LOMRs are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective BFEs, or the SFHA. The LOMR officially revises the FIRM and sometimes the FIS report. (FEMA)

Letter of Map Revision Based on Fill (LOMR-F): A LOMR-F is FEMA's modification of the SFHA shown on the FIRM based on the placement of fill outside the existing regulatory floodway. (FEMA)

Levee/Floodwall: A man-made structure designed to contain or control the flow of water. Levees and floodwalls are constructed from earth, compacted soil, or artificial materials, such as concrete or steel. To protect against erosion and scouring, earthen levees can be covered with grass and gravel or hard surfaces like stone, asphalt, or concrete. (FEMA)

Map Modernization: A multi-year Presidential initiative funded by Congress from fiscal year (FY) 2003 to FY2008, improved and updated the nation's flood maps and provided 92 percent of the nation's population with digital FIRMs. (FEMA)

Mitigation: Any cost-effective action taken to eliminate or reduce the long-term risk to life and property from natural and technological hazards, including, but not limited to, flooding. Flood mitigation measures include: elevation, floodproofing, relocation, demolition, or any combination thereof. (FEMA)

Pre-Disaster Mitigation (PDM): The PDM grant program provides funds for hazard mitigation planning and projects on an annual basis. The PDM program was put in place to reduce overall risk to people and structures, while at the same time reducing reliance on Federal funding if an actual disaster were to occur. (FEMA)

Repetitive Loss (RL) property: A RL property is any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling ten-year period since 1978. A RL property may or may not be currently insured by the NFIP. (FEMA)

Risk Mapping, Assessment, and Planning (Risk MAP) program: The FEMA program that provides communities with flood risk information and tools to support mitigation planning and risk reduction actions. (FEMA)

Severe Repetitive Loss (SRL) property: A SRL property is a single family property (consisting of 1 to 4 residences) covered by flood insurance underwritten by the NFIP and has incurred flood-related damage for which four or more separate claim payments have been paid with the amount

of each claim payment exceeding $5,000 and with cumulative amount of such claim payments exceeding $20,000; or for which at least two separate claim payments have been made with the cumulative amount of such claims exceeding the market value of the property. (FEMA)

Special Flood Hazard Area (SFHA): SFHAs are high-risk areas subject to inundation by the base (1-percent-annual-chance) flood; they are also referred to as 1-percent-annual-chance floodplains, base floodplains, or 100-year floodplains. (FEMA)

Stakeholder: An individual or group that has an interest in a decision or proposed action. A stakeholder may have none, one, or more of the following roles: has authority or decision-making power over some aspect of the project, is affected by the outcome of the project, will be a part of implementing the project, and/or can stop or delay the project (through litigation or other means). A project may have multiple stakeholders, and these stakeholders often have conflicting interests and want competing outcomes. (FEMA)

Watershed: A watershed is a basin-like landform defined by highpoints and ridgelines that descend into lower elevations and stream valleys. A watershed carries water from the land after rain falls and snow melts. Drop by drop, water is channeled into soils, aquifers, creeks, and streams, making its way to larger rivers and eventually the sea. (Watershed Atlas)

Water Year: The 12-month period beginning on October 1 for any given year and ending on September 30 of the following year. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 2013, is called the "2013" water year. (USGS)

Executive Summary

The Federal Emergency Management Agency (FEMA) Oneida Lake Watershed Discovery Report provides users with a comprehensive understanding of historical flood risk, existing flood-related data, local needs concerning FEMA Flood Insurance Studies (FISs) and Flood Insurance Rate Maps (FIRMs), and current flood mitigation activities within the Oneida Lake Watershed in New York.

In 2016, FEMA, in coordination with the New York State Department of Environmental Conservation (NYSDEC), implemented a Risk MAP Discovery Project for the Oneida Lake Watershed. The Discovery process involved significant watershed-wide data collection and outreach efforts with local stakeholders using several methods, including individual phone calls, webinars, and in-person meetings. During the outreach process, the emphasis was placed on opportunities for stakeholders to provide their comments and concerns and provide input for future mapping projects. Conversations during the meetings were focused on the types of existing data sources that could be used as part of a Risk MAP project, community mapping needs, locations of development pressure, and mitigation assistance requirements. Data collected from stakeholders within the Oneida Lake Watershed during this Discovery process can be found in Section III: *Summary of Watershed-Wide Data*.

In addition to collecting information about mapping needs and existing data sources, the Discovery project also discussed mitigation activities within the watershed. Local Hazard Mitigation Plans (HMPs) were reviewed to better understand existing flood risks within communities in the watershed. These plans are developed as part of the local planning process and are primarily multi-jurisdictional. Stakeholders provided additional information about ongoing mitigation activities in the watershed, and a number of communities requested specific training focused on hazard mitigation planning and future projects. More information on flood hazard mitigation projects and actions identified during the Discovery process can be found in Section III: *Summary of Watershed-Wide Data* in this report.

Using community mapping needs and information about existing data collected through the stakeholder engagement process, a recommended scope of work for the Oneida Lake Watershed Discovery project was developed. This watershed consists of five counties and 63 communities. Communities in the Oneida Lake Watershed have a mix of updated digital countywide FIRMs and older community based, paper FIRMs developed between 1976 and 2001. While communities in Oneida and Oswego Counties have updated countywide FIRMs and communities in Onondaga County have updated preliminary mapping scheduled to become effective in November 2016, communities in Madison and Lewis Counties would benefit from a modernized countywide FIRM in a digital format. Many community officials find the existing maps difficult to work with. In particular, stakeholders noted it is challenging to locate structures on these maps accurately. Many of the communities, particularly in Madison County, noted there is growth along major water bodies. While a wholesale restudy of each county may not be warranted, there are several key stream segments in each county which require a new detailed study. The new

detailed studies, combined with updated approximate studies in a new digital format would assist both the communities and the counties in enforcing floodplain regulations and managing development. Beyond upgrading existing detailed and approximate mapping for Madison and Lewis Counties to a digital format, the resulting scope of work also included ten high priority stream/lake study requests with a total detailed stream study mileage of 150.2 miles and a total detailed lake study mileage of 22.96 miles. More specific information on stream study requests and other community needs collected through the Discovery process can be found in Section VI of this report. A copy of the recommended scope of work can be found in Appendix N: *Oneida Lake Watershed Recommended Scope of Work Memorandum*.

I. Discovery Overview

The Federal Emergency Management Agency's (FEMA's) Risk MAP program helps communities identify, assess, and reduce their flood risk. Through Risk MAP, FEMA provides information to enhance local hazard mitigation plans, improve community outreach, and increase local resilience to floods.

The Oneida Lake Watershed Discovery project is an interactive process that gathers existing data useful in updating Flood Insurance Studies (FISs), and results in a watershed-wide assessment of existing flood hazard mapping needs, and ultimately, recommendations for the development of updated Risk MAP products, such as revised Flood Insurance Rate Maps (FIRMs).

Discovery occurs after FEMA's planning and budgeting cycle, when watersheds of interest have been selected for further examination in coordination with Federal and State-level stakeholders. Watersheds are selected based on risk, need, available topographic data, and other factors. The data that FEMA has readily available is gathered and prepared at the national and regional level and augmented by community-supplied flood risk information and data collected during the Discovery process. Community participation is necessary to assure that FEMA has the most up-to-date understanding of a community's flood risk.

The Discovery process does not necessarily mean that a new Risk MAP project will take place – instead, it is the process through which FEMA and the New York State Department of Environmental Conservation (NYSDEC) learn about local flooding issues and prioritize the need for new studies or other support that may be provided under the Risk MAP program. Additional support may include the development of new training programs or providing assistance to selected communities to advance mitigation actions or join the Community Rating System (CRS).

During Discovery, FEMA, NYSDEC, and partners:

- Gather information about local flood risk and flood hazards;
- Review mitigation plans to understand local mitigation capabilities, hazard risk assessments, and current or future mitigation activities;
- Support communities within the watershed to develop a vision for the watershed's future;
- Collect information from communities about their flooding history, effective FIRM usability, development plans, daily operations, and stormwater and floodplain management activities;
- Use all information gathered to identify and prioritize areas of the watershed that require revised mapping, risk assessment, or mitigation planning assistance through a Risk MAP project; and
- Develop a Discovery Report and Maps that summarize and display the Discovery findings.

II. Oneida Lake Watershed Overview

Watershed Characteristics and Geography

As described by the U.S. Geological Survey (USGS), watersheds in the United States are "divided and sub-divided into successively smaller hydrologic units (watersheds) which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system."[1]

The Oneida Lake Watershed boundary is determined at the HUC-8 hydrologic unit level, meaning it is comprised of 8 digits. The HUC-8 code for the Oneida Lake Watershed is 04140202. The first two digits of the 8 digit HUC number are the code for the Regional Boundary (e.g., 04, for the Great Lakes Region). The next two digits of the HUC are the code for the Subregional Boundary (e.g., 0414, Southeastern Lake Ontario). The following two digits are the code for the Accounting Unit (e.g., 041402, Oswego River Basin, New York). The last two digits of the HUC are the Cataloging Unit (e.g., 04140202, Oneida). Figure 1 shows the boundaries of the watershed. Note that the official name of the HUC-8 hydrologic unit 04140202 is "Oneida" rather than "Oneida Lake." To help clarify the extent of the watershed, this Discovery project uses the term "Oneida Lake Watershed."

Figure 1: Oneida Lake Watershed

The Oneida Lake Watershed occupies 957,943 acres of central New York State, and contains portions of Lewis, Madison, Oneida, Onondaga, and Oswego counties. Urban areas make up 7% of the watershed and include the cities of Syracuse, Rome, and Oneida along with their surrounding suburbs. In the eastern and southern areas of the watershed, agriculture is more

[1] *Hydrologic Unit Maps*, U.S. Geological Survey. *usgs.gov*. http://water.usgs.gov/GIS/huc.html.

dominant[2]. The watershed contains over 1,200 farms, primarily raising livestock. Dry hay and haylage are the most common crops followed by corn or grain for silage. Oneida Lake is the largest water body located entirely within the State, with a surface area of 79.8 square miles and a length of 20.9 miles. The Tug Hill region in the northeast portion of the watershed is the most rural area of the watershed, with large swaths of forest and wetlands. The remainder of the watershed is more urbanized.

The Erie Canal

In 1817, New York State began work on the Erie Canal. As is well documented, the original Erie Canal ran 363 miles from Albany, south of the confluence of the Mohawk and Hudson Rivers westward to Buffalo on Lake Erie. The completion of the canal in 1825 allowed the development and settlement of western New York and the then "Northwest Territories" of the Ohio River Valley. The canal enabled the transportation of goods from the interior of the continent to the port at New York for as much as 95 percent less than had previously been possible.[3]

The Erie Canal is still in use today as the New York State Barge Canal and traverses a significant portion of the Oneida Lake Watershed. The canal uses the Mohawk River from just upstream of its confluence with the Hudson River to Frankfort, a distance of over 90 miles or about a third of the canal's total length. From Frankfort westward, the canal follows in close proximity the natural course of the river until at Rome where the canal leaves the Mohawk River valley for the first time to reach Oneida Lake.

After traversing the approximately 21 miles of Oneida Lake, at the western end of the lake the canal utilizes the heavily engineered Oneida River to its confluence with the Seneca River northwest of Syracuse.

Demographics

Population

The Oneida Lake Watershed covers all or part of 70 towns, cities and villages and has a population of 265,929[4]. The largest jurisdictions within the watershed are the cities of Syracuse, Rome, and Oneida. The distribution of population can be seen in Table 1.

[2] *Oneida Watershed Rapid Assessment Profile, Natural Resources Conservation Service*
[3] *Erie Canal Time Machine.* New York State Archives. *archives.nysed.gov*.
[4] *Oneida Watershed Rapid Assessment Profile, Natural Resources Conservation Service*

Table 1: Approximate 2010 Population in the Oneida Lake Watershed

County	Total County Population (2010 data)	Percent of County Population in Oneida Lake Watershed	2010 Estimated Population in the Oneida Lake Watershed (Based on % in Watershed * Total Population)	Square Miles in Oneida Lake Watershed
Lewis	26,944	10%	2,694	121
Madison	73,442	49%	35,986	321
Oneida	234,878	38%	89,254	461
Onondaga	467,026	31%	144,778	241
Oswego	122,109	31%	37,854	295

Source: U.S. Census Bureau

Government/Representatives

Indian Territories

The Oneida Lake Watershed Discovery project area includes one federally recognized Indian territory, the Oneida Indian Nation's Turning Stone Resort and Casino in Madison County (Figure 2). The watershed is also home to the Onondaga Indian Nation, whose 7,300-acre reservation includes 1,475 people and is located in Onondaga County near the Town of Nedrow[5]. However, this area is outside of the Discovery project boundary.

Figure 2: Location of the Oneida Indian Territory in Project Area

Lewis County

The Lewis County Legislature serves as the County's policymaking body. The Legislature is responsible for establishing County policies, reviewing the administration of government, appropriating funding, levying taxes, reviewing and adopting the annual budget and enacting resolutions and local laws. There are ten equal population districts in Lewis County, some encompassing more than one municipality. The ten legislators are elected to two-year terms and represent the citizens residing in each district. Each town within Lewis County has a Town Supervisor who functions as the chief executive official. Towns within the County also have Town Boards who are the legislative and administrative body for the Town. Each Town Board consists of the Supervisor and four Councilpersons, all elected[6].

[5] http://www.onondagaanation.org/aboutus/facts/
[6] http://www.townofcroghan.com/town-board.html

Madison County

The Madison County Board of Supervisors serves as the County's policy-making body. Eighteen supervisors serve two-year terms representing their individual towns, except the Supervisors from the Towns of Madison and Sullivan who serve four-year terms. Decisions are determined on a system of weighted voting based on population. The Chairman of the Board of Supervisors is the chief elected official in the county[7]. Each town within Madison County has a Town Supervisor who functions as the chief executive official. Towns within the County also have Town Boards who are the legislative and administrative body for the Town. Each Town Board consists of the Supervisor and four Councilpersons, all elected[8].

Oneida County

A County Executive and Board of Legislators govern Oneida County. The County Executive is the Chief Executive Officer and Chief Budget Officer of County government. The 23 member Board of Legislators is the governing, appropriating and policy making body of the County[9]. Like Madison and Lewis County, each town within Oneida County has a Town Supervisor who functions as the chief executive official. Towns within the County also have Town Boards who are the legislative and administrative body for the Town. Each Town Board consists of the Supervisor and four Councilpersons, all elected[10].

Onondaga County

A County Executive and Board of Legislators govern Onondaga County. The County Executive is the Chief Executive Officer and Chief Budget Officer of County government. The 24 member Board of Legislators is the governing, appropriating and policy making body of the County. Like Lewis, Madison, and Oneida Counties, each town within Onondaga County has a Town Supervisor who functions as the chief executive official. Towns within the County also have Town Boards who are the legislative and administrative body for the Town. Each Town Board consists of the Supervisor and four Councilpersons, all elected[11].

Oswego County

A 25 member Board of Legislatures governs the two cities, ten villages, and twenty-two towns in Oswego County. The City of Oswego is the County seat. Like all other counties in the watershed, each town in Oswego County has a Town Supervisor who functions as the chief executive official. Towns within the County also have Town Boards who are the legislative and administrative body for the Town. Each Town Board consists of the Supervisor and four Councilpersons, all elected[12].

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[7] *Madison County Hazard Mitigation Plan*
[8] *Madison County Hazard Mitigation Plan*
[9] http://www.ocgov.net/leg
[10] *Oneida County Hazard Mitigation Plan*
[11] *Onondaga County Hazard Mitigation Plan*
[12] *Oswego County Hazard Mitigation Plan*

Property Ownership

Land ownership in the watershed is diverse. Agricultural activity is concentrated in the southern portion of the watershed, especially in Madison, Onondaga, and Oneida Counties. Farm operations in the watershed are dominated by livestock and the predominant crops are dry hay, haylage, corn, and grain. As mentioned previously, the watershed is home to the Oneida Indian Nation and the Onondaga Indian Nation.

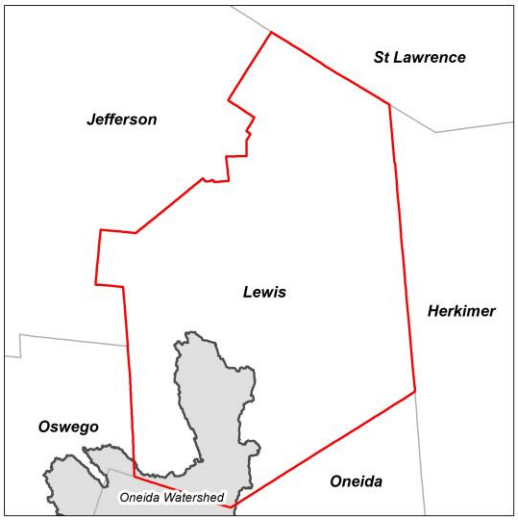

Figure 3: Lewis County

Lewis County

Lewis County is located in northwest New York, north of the city of Syracuse. The eastern portion of the County is located in the Adirondack Park, while the western part is located in the Tug Hill Plateau. The population of Lewis County is 26,944, and the county seat is the Village of Lowville. The County has an area of 1,290 square miles, with an average of 21.1 persons per square mile. Population is centered in the Black River Valley, where the Black River Canal system connects local communities to the Erie Canal. Agriculture is the most significant industry in the county, with a mixture of small family farms and larger operations. Manufacturing is also an important sector of the county economy. While the overall trend in manufacturing in the county has been a decline over the past 20 years, several new manufacturing firms have recently located to the county[13]. Out of 24,374 parcels, residential properties (12,382) and public parks, wild, forested, and conservation properties (2,854) were the highest use categories by parcel count[14].

Madison County

Madison County is located in Central New York State, adjacent to Oneida Lake. The County covers an area of 655 square miles and has a population of 73,442, with an average of 88 people per square mile[15]. The county seat is the Village of Wampsville. Major employers in Madison County include Colgate University, Oneida Health Care, Dielectric

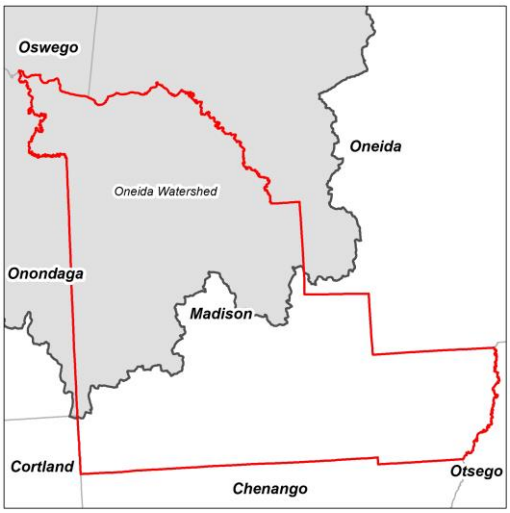

Figure 4: Madison County

[13] *Lewis County Hazard Mitigation Plan*
[14] http://orpts.tax.ny.gov/MuniPro/
[15] http://www.census.gov/quickfacts/table/PST045215/36053,00,

Laboratories, and Esco Turbine Technology.[16] Out of 37,854 parcels, residential properties (23,704), and vacant land (8,249) were the highest use categories by parcel count[17].

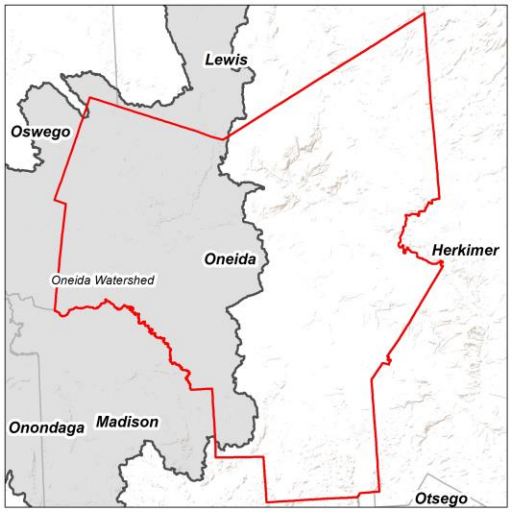

Figure 5: Oneida County

Oneida County

Oneida County is located in Central New York, on the shores of Oneida Lake, with a land area of 1,212 miles and population of 234,878[18]. The City of Utica is the county seat. The County's landscape includes portions of the foothills of the Adirondacks and the Tug Hill Plateau, which is known as the "snow belt" of New York State. Major education institutions include Hamilton College, State University of New York (SUNY) - Institute of Technology, Utica College, Utica School of Commerce, Herkimer County Community College, and Mohawk Valley Community College[19]. Major employers include Conmed, Utica National Insurance Group, and Metropolitan Insurance Company[20]. Out of 105,207 parcels, residential properties (72,389) and vacant land (19,263) were the highest use categories by parcel count.[21]

Onondaga County

Onondaga County is located in central New York State in the eastern portion of the Finger Lakes Region. Onondaga is the most populated county in Central New York, with an estimated population of 467,026, an area of 778 square miles, and an estimated 600 people per square mile[22]. The City of Syracuse is the county seat. Due to its location within the Finger Lakes Region, Onondaga County borders or contains five major lakes: Cross Lake, Oneida Lake, Onondaga Lake, Otisco Lake, and Skaneateles Lake. The Onondaga Indian Reservation is also located in the County. Agriculture remains a large type of land use with 681 farms and an estimated $152 million in agricultural product sales in 2012[23]. The County's

Figure 6: Onondaga County

[16] https://www.madisoncounty.ny.gov/sites/default/files/planning/Final Madison County Strategy 2013.pdf
[17] http://orpts.tax.ny.gov/MuniPro/
[18] *Oneida Hazard Mitigation Plan*
[19] http://www.ocgov.net/oneida/planning/regionalprofile
[20] *Oneida County Hazard Mitigation Plan*
[21] http://orpts.tax.ny.gov/MuniPro/
[22] http://www.census.gov/quickfacts/table/PST045215/36067,00
[23] *Agricultural Census 2012*

largest business sectors are health, manufacturing, and retail. Its largest employers include Syracuse University, National Grid, SUNY Upstate Medical Center, Bristol Myers Squibb, Verizon Communications, Lockheed Martin, and Blue Cross/Blue Shield. Out of 182,336 parcels, residential properties (143,507) and vacant land (19,901) were the highest use categories by parcel count.[24]

Oswego County

Oswego County is located in northwestern New York, north of Syracuse. Oswego is bordered to the west by Lake Ontario and to the south by Oneida Lake. The County has a total land area of 1,312 square miles of which 359 are water. The county seat is the City of Oswego. Residents are primarily employed in government positions or in trade/transportation/utilities. Out of 59,561 parcels, residential properties (41,928) and vacant land (11,633) were the highest use categories by parcel count.[25]

Figure 7: Oswego County

More information on property ownership can be found on each County's Real Property webpage as noted in Table 2: Links to County Real Property Webpages.

Table 2: Links to County Real Property Webpages

County	Hyperlink to Real Property Webpage
Lewis	http://lewiscountyny.org/content/departments/View/43
Madison	https://www.madisoncounty.ny.gov/real-property/office-real-property-tax-services
Oneida	http://www.ocgov.net/realproperty
Onondaga	http://www.ongov.net/rpts/propertyTaxInfo.html
Oswego	http://oswegocounty.com/rpts.shtml

Land Use

A comprehensive plan is a land-use document providing framework and policy direction for land-use decisions. Comprehensive plans usually include chapters detailing policy direction affecting land use, transportation, housing capital facilities, utilities, and rural areas. Comprehensive plans identify where and how growth needs will be met. For the sake of floodplain management and hazard mitigation, a land-use management plan can be a powerful tool to guide the community to increased resilience. If a community has a comprehensive plan, it needs to be in compliance with both the local flood damage prevention ordinance and local Hazard Mitigation Plan (HMP).

[24] *http://orpts.tax.ny.gov/MuniPro/*
[25] *http://orpts.tax.ny.gov/MuniPro/*

The 2001 National Land Cover Database divides land cover in the United States into sixteen classes. In the Oneida Lake Watershed, forest accounts for 40.5% of the land cover, followed by grassland (16.4%), wetland (0.6%), shrub/scrub (10.2%), cultivated crops (9%), open water (6.5%), developed land low intensity (5.9%), developed land medium/high intensity (.7%), and barren land (.2%) [26].

Lewis County

None of the communities in the Oneida Lake Watershed within Lewis County have an active Comprehensive Plan. The Town of Montague in Lewis County has seen significant recent development, and is taking steps to regulate development in floodplains and steep slopes with the Town's Land Use Law and Subdivision Control Law[27]. The County includes 634 farms on 181,741 acres of farmland and produced $137 million in livestock and crop sales in 2012[28].

Madison County

Many municipalities in Madison County have Comprehensive Plans. The County is one of the top 100 dairy counties in the United States, with over 300 commercial dairy farms[29] and 838 farms in total that produced $117 million in livestock and crop sales in 2012[30]. Madison County's 2005 *Agricultural and Farmland Protection Plan* led to the development of an Agricultural Economic Development Program that focuses on providing technical assistance, workshops, and other projects to promote a "*viable agricultural economy that benefits Madison County."*[31] In 2012, Madison County was 1 of only 5 counties in the country selected by the Environmental Protection Agency (EPA) for the Smart Growth Implementation Assistance (SGIA) program. EPA worked with Madison County to develop a Smart Growth Assessment tool (Figure 8), outlining 10 best practices that rural communities within the county can apply to comprehensive plans and land use ordinances[32].

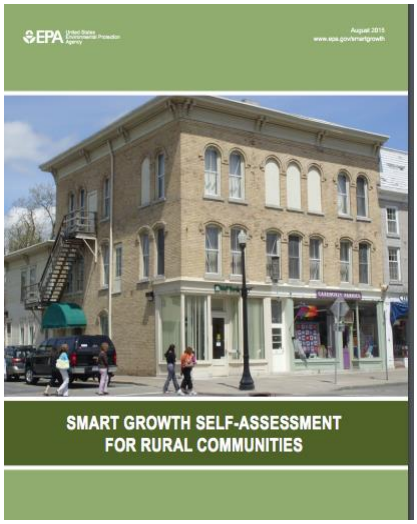

Figure 8: EPA and Madison County Smart Growth Self-Assessment Tool for Rural Communities

Madison County is one of two counties in the Oneida Lake Watershed participating in the New York Rising Community Reconstruction (NYRCR) program. The NYRCR program is a voluntary recovery and resiliency initiative that was established to provide assistance to communities damaged by Superstorm Sandy, Hurricane Irene, Tropical Storm Lee, and storms

[26] *Oneida Watershed Rapid Assessment Profile, Natural Resources Conservation Service*
[27] *Lewis County Hazard Mitigation Plan*
[28] https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/New_York/st36_2_001_001.pdf
[29] *Madison County Hazard Mitigation Plan*
[30] http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/New_York/st36_2_001_001.pdf
[31] http://madisoncountycce.org/agriculture/agriculture-economic-development
[32] https://www.madisoncounty.ny.gov/planning/smart-growth

and severe flooding in June and July of 2013. Each community in the program forms a Countywide NYRCR Planning committee to create a countywide Resiliency plan that identifies remaining recovery needs and develops countywide long-term resiliency strategies and actions. Madison County's Resiliency Plan was published in 2014 and focuses on addressing remaining recovery needs from the severe storms and flooding of June and July 2013. Madison County's resiliency strategies include:

- Providing flood proof emergency shelter and facilities for the community;
- Collaborating with nearby communities to foster regional cooperation in addressing flooding and related issues; and
- Upgrading and/or relocating critical facilities and infrastructure out of the floodplain.

Specific actions include:

- Culvert repairs;
- Stream bank stabilization and restoration; and
- Infrastructure inventory and mapping.

Oneida County

Due to its fertile prime farmland soils, agriculture is a major industry in Oneida County. The County includes 1,066 farms on 205,106 acres of farmland and produced $113 million in livestock and crop sales in 2012. Oneida County is in the Utica Urbanized Area, which includes 13 active regulated Municipal Separate Stormwater Sewer System (MS4) communities that are subject to regulation by NYSDEC and are required to develop Stormwater Management Plans. Sustainable methods to mitigate flooding and stem stormwater runoff are being undertaken in several communities within the County[33]. These practices include:

- Preserving and restoring natural landscape features;
- Reducing amount of land covered by impervious surface;
- Green roofs;
- Rain gardens;
- Vegetated swales; and
- Planters and stream buffers.

Figure 9: Volunteers Install Rain Garden, an Example of Green Infrastructure, in New Hartford Town Park, Oneida County. Source: Oneida County Hazard Mitigation Plan.

[33] *Oneida County Hazard Mitigation Plan*

In 2011, the City of Utica received a New York Green Infrastructure Grant Program (GIGP) grant of $646,641, focusing on reducing stormwater runoff into the Mohawk River and promoting urban revitalization through restoration of the urban canopy. The City of Rome received $250,000 of GIGP grant funding, focusing on inventory and analysis of existing trees, tree planting, and retrofitting paved surfaces downtown. [34]. Specific actions included:

- Installation of bio-retention/bio-filtration practices, porous pavement, and rain gardens;
- Construction of green parking areas.

Oneida County is the second county in the watershed participating in the NYRCR program. Oneida County's resiliency plan was published in 2014, and, as in Madison County, focuses on addressing remaining recovery needs from the severe storms and flooding of June and July 2013. Resiliency strategies include:

- Utilizing a combination of stream bank restoration/realignment and upgrading of infrastructure at stream crossings to reduce erosion and mitigate flooding and losses;
- Educating the public and decision makers on sustainable floodplain development to reduce flood risks and environmental degradation; and
- Expanding, updating, and sharing watershed data to guide watershed planning decisions.

Specific actions and projects include:

- Culvert upgrade and bank stabilization in the Town of Augusta;
- Countywide public education on flood damage prevention and flood evacuation; and
- Countywide hydraulic and hydrologic modeling of creeks and lakes.

Onondaga County

Onondaga County has a relatively compact development pattern composed of rural, urban, and suburban areas. The City of Syracuse is the largest population center in the County and the main urban area, as well as the largest employment center in the County. Historically, land development in Onondaga County has followed a pattern of decentralization, with expansion in suburban municipalities and the most growth in northern municipalities[35]. Agriculture remains a significant land use type, with 681 farms occupying 150,269 acres in 2012 and producing $152 million in livestock and crop sales in 2012 (ranking Onondaga 12th in the state) [36]. The County has seen a dramatic redistribution of population; over the past 80 years the proportion of total population living in County towns has increased from 30% to 70%, while the proportion of County residents living in the City of Syracuse has dropped from 70% to 30%[37]. This population shift from a dense urban core towards low-density suburban sprawl has led to a 92% increase in the amount of urbanized land. The County is currently updating their 2010 County Sustainable

[34] *Oneida County Hazard Mitigation Plan*
[35] *Onondaga County Hazard Mitigation Plan*
[36] *2012 USDA Agricultural Census*
[37] *http://future.ongov.net/wpcontent/uploads/2012/06/Sustainable Development Plan Summary Report - draft June 2012.pdf*

Development Plan to focus on promoting smart growth and compact settlement patterns. The Plan will be linked with the County's Climate Change Action plan and the update of the Syracuse Metropolitan Transportation Council Long Range Transportation Plan. Onondaga County is struggling with challenges including a reduction in farmland, inability to support mass transit, increased driving and a larger carbon footprint, and concentrations of poverty.

Onondaga County is in the Syracuse Urbanized Area, which includes 32 active regulated MS4 communities that are subject to regulation by NYSDEC, and are required to develop Stormwater Management Plans. Green infrastructure practices to mitigate flooding and stem stormwater runoff are being undertaken in several communities within the County. These practices include:

- Green roofs
- Rain gardens
- Permeable pavement
- Bio-swales or vegetated swales
- Rain barrels
- Cisterns

Onondaga County's "Save the Rain" program focuses on reducing stormwater pollution and runoff to Onondaga Lake. Since its inception in 2009, the County has advanced more than 180 green infrastructure projects[38].

Oswego County

Land use within Oswego County is primarily residential and rural. The County includes 657 farms on 94,209 acres of farmland and produced $47 million in livestock and crop sales in 2012[39]. There are numerous freshwater wetlands within the County due to its close proximity to Lake Ontario. The highest population densities are within the Counties' two cities: Oswego and Fulton.

Table 3: Links to County Land Use Data

County	Hyperlink to Comprehensive Plans
Lewis	http://lewiscountyny.org/content/Generic/View/20
Madison	https://www.madisoncounty.ny.gov/planning/land-use-zoning
Oneida	http://www.ocgov.net/planning/landusezoning
Onondaga	http://www.ongov.net/planning/planning.html
Oswego	http://oswegocounty.com/planning.shtml

[38] *http://savetherain.us/about/*

[39] *https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/New_York/st36_2_001_001.pdf*

Table 4: U.S. Census 2010 and USDA Census of Agriculture 2012

County	Land Area (Square Miles)	Farm Land (Acres)	Farm Land (Acres) Within Watershed	Total Farms Within Watershed
Lewis	1,290	181,741	16,725	62
Madison	755	187,496	92,777	365
Oneida	1,212	205,106	73,048	385
Onondaga	778	150,269	46, 655	215
Oswego	1,312	94,209	31,080	198

Source: U.S. Census Bureau 2010, USDA Census of Agriculture 2012

Media

The Syracuse media market serves Madison, western Oneida County, Onondaga, and Oswego Counties. The Utica New York media market serves eastern Oneida County, and Lewis County is in the Watertown media market.

Lewis County newspapers include:

- *The Chronicle*
- *Journal & Republican*
- *Watertown Daily Times*

Madison County newspapers include:

- *Madison County Courier*
- *Cazenovia Republican*
- *Mid-York Weekly*

Oneida County newspapers include:

- *Oneida Daily Dispatch*
- *Observer-Dispatch*
- *Star-Journal*

Onondaga County newspapers include:

- *The Post-Standard*: Syracuse
- *Syracuse New Times*

Oswego County newspapers and media include:

- *Oswego County Today* (online)
- *Oswegonian*
- *Palladium Times*
- *The Valley News Inc.*

- *Fulton Daily News*
- *Fulton Bureau*
- *Oswego Daily News*

There are 12 local and regional radio stations and 12 local television stations in the watershed.

Historic Flooding Problems

Overview

Throughout the recorded history of the Oneida Lake Watershed, flooding has been a constant threat. Floods in the summer months are often associated with tropical systems moving north along the Atlantic coast. During the winter, flooding is a threat when ice jams impede the free flow of rivers in the watershed. Flooding usually occurs in the late winter and early spring when the ground is still frozen and snowmelt adds to heavy rainfall to produce increased runoff.

Lewis County

Lewis County is ranked as one of 19 counties in New York State with moderately high flood risk[40]. Flooding is primarily caused by riverine flooding, shallow flooding from urban drainage issues, and occasional ice jams. The County's topography also influences flooding; the Black River Valley plain, covering 61% of the County, is extremely flat leading towns in the region to be prone to flooding[41]. Of the seven federal disaster declarations covering the County since 1985, four have been for flooding. The National Climactic Data Center (NCDC) reports that Lewis County has had 21 flood events since 1994, totaling more than $4 million in property damages. Additionally, the County's Hazard Mitigation plan estimates that more than half of the municipalities in the County have structures in the Special Flood Hazard Area (SFHA), and that 4,700 acres of developable land are in the SFHA[42].

Lewis County's annual snowfall is among the highest in the state, with an average of 158 inches per year. The County also receives an average of 15-18 hours of freezing rain per year, one of the highest rates in the country. The NCDC reports that Lewis County has been affected by 129 significant snow and ice events between 1993 and 2009, with more than $92 million in cumulative property damage[43].

Madison County

Madison County is located at the headwaters of three major drainage basins: the Susquehanna River, Oneida Lake, and the Hudson River[44]. This position at the top of the watershed means neighboring counties located downstream typically have more flooding problems. Much of the county's flooding occurs as a result of its topography; the northern municipalities such as the Town of Lenox, the City of Oneida, and the Village of Chittenango have historically seen the

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[40] *New York State Hazard Mitigation Plan, 2014*
[41] *http://lewiscountyny.org/content/generic/View/20:field=documents;/content/Documents/File/862.pdf*
[42] *Lewis County Hazard Mitigation Plan*
[43] ibid.
[44] *Madison County Hazard Mitigation Plan*

worst flooding. During peak flows caused by spring snow-melt or heavy rains, many creeks in the county carry large volumes of water. As these creeks approach the lowlands, velocity slows and the creeks overflow their banks. Oneida Creek was the source of severe flooding in the summer of 2013. Areas of the county received up to 4.5 inches of rain in just two days. Entire neighborhoods, including the Oneida Flats neighborhood in the City of Oneida, were flooded in up to 6 feet of water, necessitating evacuation of hundreds of residents. A state of emergency was declared for Madison County and six other impacted counties, including Lewis County. A number of businesses and municipal facilities were also damaged in the City of Oneida[45].

Oneida County

Oneida County occupies four distinct drainage basins: the Mohawk River Basin, the Black River Watershed, the Great Lakes Basin, and the Upper Susquehanna. The county's position near Oneida Lake makes it susceptible to flooding as well as ice jams. Flooding usually occurs in the late winter and early spring months, resulting from ice blockages, spring rainfall, and snowmelt. Flooding can also occur during heavy rain in the summer months, as seen in Figure 10 when severe flooding occurred in the City of Oneida as a result of regional flooding between June 26 and July 10.[46] The county's four creek systems (Oriskany, Sauquoit, Mud, and Big) have been identified by NYSDEC as high flood risk streams due to the fact that they cause frequent flooding to nearby development and infrastructure. From 1960 to 2012, Oneida County experienced 70 flood events that resulted in five fatalities, $65 million in property damage, and more than $1 million in crop damage. Nine of the flood events, representing $3.25 million in damage, occurred from 2010 to 2012[47]. Hurricane Irene and Tropical Storm Lee brought heavy precipitation and flooding to the area in August 2011. The 2013 summer storms that impacted Lewis and Madison County also brought significant damage to the southern portion of Oneida County[48]. The sheer volume of rainfall, combined with culvert and bridge failures, caused all four-creek systems in the county to overflow their banks and flood surrounding areas. Damage was extensive in the Towns of Vernon, Verona, Sherrill, and the Village of Oneida Castle: 290 people were evacuated, 44 homes destroyed, 75 homes suffered major damage, and 50 multi-family apartments or residences were condemned[49].

Figure 10: June 2013 Flooding in the City of Oneida

[45] https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/madison_resiliency_final_plan__0.pdf
[46] http://www.syracuse.com/news/index.ssf/2014/11/new_york_will_help_local_governments_pay_for_2013_flooding_winter_storm_damage.html
[47] https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/oneida_county_resiliency_plan_final.pdf
[48] *ibid.*
[49] https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/oneida_county_resiliency_plan_final.pdf

Onondaga County

Onondaga County drains into two major river basins: the Oswego River Basin and the Susquehanna River Basin. Several water bodies in the County experience periodic flooding, including Oswego River, Oneida Lake, Oneida River, Butternut Creek, Limestone Creek, and Onondaga Creek. The most documented flooding lies within the Onondaga Lake sub-watershed, along Onondaga Creek. The water flow of the creek has been heavily altered by channelization and damming, which can lead to rapid flooding in high-water events. The County's HMP notes that the county has been issued 6 FEMA disaster declarations for flood events since 1972, with each disaster resulting in extensive damages[50]. The county is ranked as the 9th most flood vulnerable county in New York State, based on potential flood exposure and vulnerability to loss. Over 11% of the county is located in the SFHA[51].

Oswego County

Oswego County is ranked as the 11th most flood vulnerable county in New York State. The County's HMP notes that Lake Ontario, Oneida Lake, and Salmon River have all experienced documented large-scale flooding events, and the county has had three Presidential disaster declarations issued for flooding events between 1953 and 2016[52]. All 22 towns in the county, and two cities, contain properties within mapped SFHAs, and 23% of the total parcels in the county are included in mapped SFHAs[53]. Flooding is seen as a regular event that occurs between once a year and once every other year. Because the county's west/northwest boundary borders Lake Ontario, coastal flooding often occurs, inundating and eroding low-lying properties.

At the time of this report, Oneida, Onondaga, and Oswego Counties have active HMPs. Madison County's HMP expired in 2013 and they are currently in the process of updating it. Lewis County's HMP recently expired in March 2016. Significant events from these plans are summarized in *Table 5: Hazard Mitigation Plan Significant Flood Events.* See the Hazard Mitigation Planning and Activities subsection that follows for additional information on HMPs.

Table 5: Hazard Mitigation Plan Significant Flood Events

County	Location/Community	Flood Events of Significance
Lewis	Town of Martinsburg, South Black River Valley	September 1975: Almost five inches of rain fell on the region over a three-day period. Roads closed due to flooding in several towns.
	Black River Valley	January 1998: 2 inches of rain fell on already-saturated ground causing floodwaters to approach record levels in Lewis County. Hundreds of Black River Valley residents were evacuated $50,000 in damages
	Lewis, Jefferson, and neighboring counties	April 1994: Heavy precipitation combined with warm temperatures and melting snow led to flooding and damage to roads, bridges and properties, exceeding $5 million in damages.

[50] *Onondaga County Hazard Mitigation Plan*
[51] ibid.
[52] *Oswego County Hazard Mitigation Plan*
[53] ibid.

Table 5: Hazard Mitigation Plan Significant Flood Events

County	Location/Community	Flood Events of Significance
Lewis	Central Lewis County	October 1995: Heavy rains fell across the Eastern Lake Ontario counties causing the Black and Moose Rivers to overflow their banks. There was also some road and lowland flooding along the flats area of the Black River in central Lewis County. $35,000 in damages.
	Town of Martinsburg	September 2001: Heavy downpours of 6 inches of rain over 2 days caused flash flooding in Lyons Falls, Martinsburg, and Lowville. Several roads were closed or washed out.
	Town of Martinsburg	April 2002: Heavy rains and snowmelt caused Black River to rise to bank full condition flooding agricultural lands.
	Town of West Turin	November 1996: 4.5 inches of rain in 24 hours flooded Black River and washed away portions of roads in West Turin, Watson, and New Bremen.
Madison	Village of Canastota	April, 2004: Flooding occurred between Barlow Street and Beebe Bridge Road in the area of the old town dump located between the New York Central railroad tracks and the Old Erie Canal. Water was three feet deep in places; two houses needed to have their basements pumped.
	Towns of DeRuyter and Cazenovia	August 2003: Heavy rains led to floods at the base of hills and large deposits of gravel into culverts, causing roadways to overflow. Both Towns were declared disaster areas. Damages totaled $700,000.
	City of Oneida	June 2013: Record setting flood with 2.4 inches of rainfall displaced residents and caused extensive damage to 214 homes. The Oneida Creek surpassed all time record levels causing widespread damage in the City of Oneida. Many residents signed up for State buyout.
Oneida	City of Rome	January 2010: Flash flooding in the City caused significant property damage.
	Countywide	September 2011: Tropical Storm Lee led to record high of 14 feet in Oneida Creek, flooding properties and forcing road closures and evacuations. Nearly three inches of rain fell in Syracuse in one day, eclipsing previous records.
	Towns of Verona, Vernon, Augusta, Westmoreland, Kirkland, Marshall, Sangerfield, Whitestown, New Hartford, Paris, Bridgewater, City of Oneida, City of Utica	June 2013: Exceptionally wet and stormy spring caused damages throughout the month. A severe storm on June 28th brought 6 inches of water in less than 24 hours to Central New York, leading to unprecedented flooding in multiple areas of the County. Damages include $1.2 million in the City of Utica, $488,000 in Oneida County DPW, $10,000 in the Village of Oriskany Falls, and $1.5 million in the Town of Kirkland. The area is currently seeking assistance from federal, state, and local sources to mitigate the damages.
Onondaga	Countywide	January 1996: FEMA DR-1095. Severe flooding led to approximately $7.6 million in flood damages.

Table 5: Hazard Mitigation Plan Significant Flood Events

County	Location/Community	Flood Events of Significance
Onondaga	Route 31	May 2004: Storm culvert collapses under Eastwood Road during storm event.
	Volmer Creek	June 2006: Volmer Creek overflowed and inundated basements of hundreds of homes in Town of Dewitt.
	City of Syracuse	May-September 2000: Heavy rains caused significant ponding of water on Park Street, McBride Street, and Bur Street.
	Countywide	September 2004: FEMA DR-1564. County experienced approximately $2 million in flood damages.
Oswego	Oneida Lake	1994: Rain and snowmelt caused water levels to rise above flood stages and flood areas along south shore. $5,000 in damages.
	Town of Constantia	2003: Flash Flood caused $25,000 in property damage.

Source: Lewis County Hazard Mitigation Plan, Madison County Hazard Mitigation Plan, Oneida County Hazard Mitigation Plan, Onondaga County Hazard Mitigation Plan, Oswego County Hazard Mitigation Plan.

High Water Marks

To make risk assessments for flooding events, certain types of data are needed. This data consists of physical evidence, such as High Water Marks (HWMs) left by a flood event. Often, HWM evidence is transitory and can only be collected within a short span of time after an event, after which the evidence disappears. The HWM is the most important piece of information to describe the severity of a flood and it is essential that high water marks are recorded quickly after a flood event.

HWMs identified by watershed stakeholders during this Discovery projects are summarized in *Appendix G: Discovery Meeting Summary Memorandum.*

Disaster Declarations

Like much of the eastern United States, one of the most frequent, widespread, and damaging natural disasters affecting the watershed is flooding from rainfall events, especially tropical systems tracking inland from the Atlantic Seaboard. With full records beginning in the 1950s, the watershed has repeatedly been subject to flooding from tropical storms, hurricanes, and other non-cyclonic events, most recently in summer 2013.

Often in the aftermath of a major flooding event, the Federal Government will make funding available for homeowners, businesses, and local communities to aid in disaster relief and recovery. The major flood-related disaster declarations for the study area are listed in *Table 6:*

Major Disaster Declarations (as of May 2016). Since 1972, there have been 18 flood-related declared disasters within the study area. FEMA's disaster and emergency declarations history can be viewed at FEMA's website[54].

Table 6: Major Disaster Declarations (as of May 2016)

Incident Period	Title of Event	Number of Counties Declared Within Study Area
June 1972	Tropical Storm Agnes	4
March 1973	High Winds, Wave Action & Flooding	1
July 1974	Severe Storms & Flooding	3
October 1975	Storms, Rains, Landslides & Flooding	3
July 1976	Severe Storms & Flooding	1
March 1985	Flooding	2
January 1996	Severe Storms & Flooding	3
December 1996	Severe Storms, High Winds, Rain, and Flooding	1
July 2000	Severe Storms & Flooding	4
August 2003	Severe Storms, Flooding & Tornadoes	1
August 2004	Severe Storms & Flooding	5
October 2004	Severe Storms & Flooding	3
April 2005	Severe Storms & Flooding	1
July 2006	Severe Storms & Flooding	2
June 2011	Severe Storms, Flooding, Tornadoes, and Straight Line Winds	4
September 2011	Remnants of Tropical Storm Lee	1
July 2013	Severe Storms & Flooding	2
July 2014	Severe Storms & Flooding	1

Ice Jams

As explained by the National Weather Service (NWS), "ice jams cause localized flooding and can quickly cause serious problems. Rapid rises behind the jams can lead to temporary lakes and flooding of homes and roads along rivers. A sudden release of a jam can lead to flash flooding below with the addition of large pieces of ice in the wall of water which will damage or destroy most things in its path.[55]"

There are two types of ice jams: freeze up and break up. Freeze up jams usually occur in early to mid-winter during extremely cold weather. Break up jams usually occur in mid to late winter with thaws. NWS notes the conditions of both below:

Freeze Up Jam Criteria:

Three consecutive days with daily average temperatures of less than 0°F. Early to mid-winter formation, fairly steady discharge, frazil and broken border ice, unlikely to release suddenly, smooth to moderate surface roughness.

[54] http://www.fema.gov/disasters
[55] http://www.weather.gov/media/aly/Hydrology/IceJamInfo.pdf

Break Up Jam Criteria:

Ice around 1 foot thick or more (presumed) and daily average temperature forecast to be greater than 42°F or more. Direct sunlight plays a large role as open water areas absorb sunlight. A break up jam can occur at any time after ice cover formation, but generally takes place in mid to late winter. Break up jams are highly unstable with sudden failures.

The daily average temperature is determined by the following equation:

(Tmax (maximum temperature) + Tmin (minimum temperature))/2.

Rainfall or snowmelt with a thaw will enhance the potential for break up jams as rising water helps to lift and break up the ice. A very short thaw with little or no rain or snowmelt may not be enough to break up thick ice.

Flooding caused by ice jams is not calculated nor shown on FEMA's FIRMs. Furthermore, NWS's statement on ice jams also explains that river forecasts found on its website do not take into account the effect of ice on river levels. The complete list with fuller descriptions of the circumstances of jamming at each location can be found on the U.S. Army Corps of Engineers (USACE) website: http://icejams.crrel.usace.army.mil/

Lewis County

All of Lewis County has the potential for ice jams. The USACE Cold Regions Research and Engineering laboratory (CRREL) Ice Jam Database, which documents ice jams from the 1920s to the present, shows 31 distinct ice jams in the county[56]. These occurred in the following watercourses:

- East Branch Fish Creek
- Deer River
- Independence River
- Black River

In addition to the incidents listed in the CRREL database, one of the flooding incidents from the NCDC database mentions that "flooding was reported in Lewis County along the Moose River due to a massive ice jam" in January 1999. Lewis County's HMP states that based on known occurrences, an ice jam occurs in Lewis County approximately once every 2.5 years[57].

Madison County

Ice jams are ranked as a hazard of medium concern in the county. There is no section in the HMP discussing specific ice jam events in the county.

Oneida County

Ice jams are ranked as a hazard of medium concern in the county. According to historic data, ice jam flooding has occurred in the county at least two times on a large scale. The Mohawk River

[56] *Lewis County Hazard Mitigation Plan*
[57] ibid.

flooded due to ice jams in 1959, causing problems in Oneida, Herkimer, Montgomery, and Schenectady Counties. Two ice jams occurred in Madison County in 2003, causing flooding in the Town of Kirkland and the Village of Sylvan Beach. Oneida County's HMP notes that the continuing problems with ice jams in Sauquoit Creek are a focus of the Sauquoit Creek Basin Coalition[58].

Onondaga County

The USACE CRREL Ice Jam Database indicates that approximately seven ice jam events have occurred within Onondaga County between 1936 and 2007. Ice jams have occurred along Seneca River, Onondaga Creek, Butternut Creek, Hemlock Creek and Limestone Creek.

Oswego County

Oswego County's HMP notes that ice jams have commonly occurred along the Oswego River, and also form along the Oneida River and Salmon River[59].

Dams

According to the NYSDEC Dam Safety Section's dam inventory, the Oneida Lake Watershed contains 208 dam structures. NYSDEC uses a classification scale of A to D to assign hazard potential to each of the dam structures contained within the inventory. NYSDEC classifies dams in the State using the following criteria:

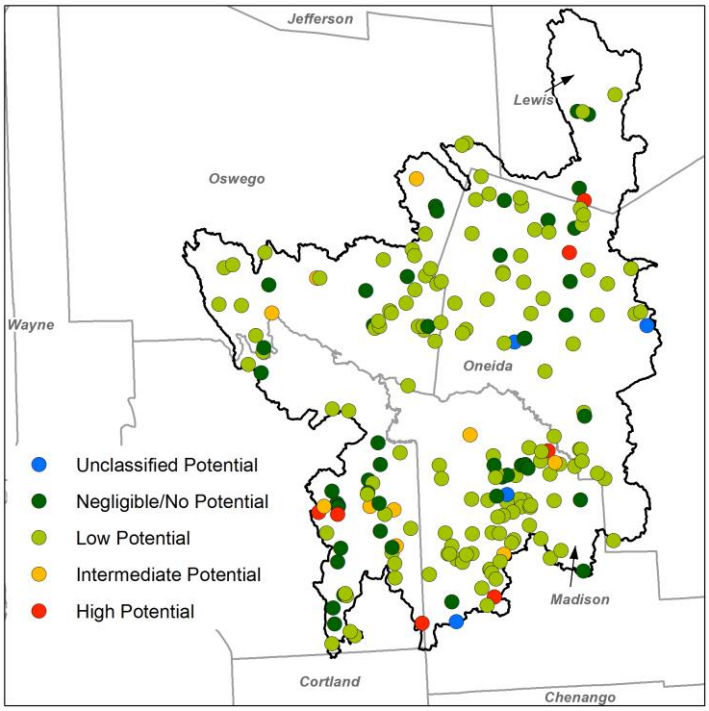

Figure 11: Location of Dams

Class A-Low Hazard Potential: Resulting damages from a dam failure would likely be minimal and not interfere with any critical infrastructure; personal injury and substantial economic loss is unlikely to occur.

Class B-Intermediate Hazard Potential: A dam failure may result in damage to isolated homes, roads, and railways; critical facilities may experience disruption; personal injury or substantial economic loss is likely, but loss of human life is not expected.

[58] *Oneida County Hazard Mitigation Plan*.
[59] *Oswego County Hazard Mitigation Plan*

Class C-High Hazard Potential: Dam failure may result in widespread or serious damage to homes; damage to roads, railroads, commercial buildings, and critical infrastructure is expected; loss of human life and substantial economic loss is expected.

Class D-Negligible or No Hazard Potential: Dam has been breached, removed, or otherwise has failed or no longer materially impounds waters, or the dam was planned, but never constructed at this location. Class D dams are considered to be defunct dams posing negligible or no hazard.

Class 0-Unclassified Hazard Potential: Hazard code has not yet been assigned.

Table 7: Dams in the Oneida Lake Watershed

County	Class A	Class B	Class C	Class D	Class 0 (Unclassified)	Total
Lewis	2	0	1	3	0	6
Madison	51	3	2	10	2	68
Oneida	40	0	1	8	2	51
Onondaga	17	4	3	18	0	42
Oswego	30	3	0	8	0	41
Total	**140**	**10**	**7**	**47**	**4**	**208**

Source: NYSDEC

Recent Media Coverage of Natural Hazards

A summary of recent media coverage of natural hazards in the Oneida Lake Watershed is provided below.

- *Central New York, June 2013:* Severe rainstorms hit upstate New York and caused extensive damages in Oneida and Madison Counties. A state of emergency was issued in 15 counties and a federal Disaster Declaration (DR-4129) was issued for Madison and Oneida Counties as well as several counties outside the watershed. Newspapers and media outlets across Central New York covered the storms. Crests of more than 17 feet on Oneida Creek flooded the City of Oneida; portions of the City were covered in more than six feet of water. In February 2016, FEMA recently approved more than $21 million in federal funding to buy 154 properties in the City damaged or destroyed by the flooding[60].

[60] http://www.oneidadispatch.com/article/OD/20160215/NEWS/160219866

- *Lewis County, April 2014*: Several newspapers reported on flooding in the Black River, which led to several road closures, four bridge closures, and damages in the towns of Castorland, Croghan, and Lyons Falls. Several farms in Castorland had widespread displacement of cattle and loss of feed (see Figure 12)[61].

Figure 12: Flooding occurs on farms in Lewis County in April 2014.

- *Oswego County, 2014:* Several area newspapers reported on flooding along the shoreline of Lake Ontario, which affected the Town of Sandy Creek and flooded hundreds of homes and seasonal camps. Ice jams and sand blocked the outlet from Sandy Pond onto Lake Ontario, and the pond spilled over with rain and melting snow.

- *Syracuse, 2016*: Newspapers and websites such as NYCentral.com reported on heavy rains and melted snow that contributed to flooded roadways in Oswego and Madison Counties.

[61] *http://www.wwnytv.com/news/local/Flood-Traps-Lewis-County-Farms-Schumer-To-Visit-Friday-255698251.html*

III. Summary of Watershed-Wide Data

National Flood Insurance Program (NFIP) Data

Effective Regulatory FIRMs

As noted in earlier sections of this report, the Oneida Lake Watershed covers portions of five counties in the State. The mapping in place is a mix of recently revised and older FIRMs.

The Town of West Turin in Lewis County, the Town of Stockbridge and Village of Wampsville in Madison County, the Village of North Syracuse in Onondaga County, and the Village of Central Square in Oswego County have no FIRMs, and are participating in the NFIP with no SFHAs identified. Even though the communities do not have a FIRM, residents are still eligible to purchase flood insurance. This allows them to buy down local flood risk from storm runoff.

Oneida and Oswego Counties currently have effective countywide FIRMs, both of which are effective as of 2013.

Lewis and Madison County communities do not have a countywide FIRM. All communities in Lewis County have community-based FIRMs, with map dates ranging from 1976 to 1996. All communities in Madison County have community-based FIRMs, with map dates ranging from 1982 to 2001.

The countywide FIRM for Onondaga County is effective November 4, 2016. This map update included restudied flood hazards for 70 stream miles within the county, including Ninemile, Limestone, Skaneateles, and Onondaga Creeks and Harbor and Meadow Brooks.

To date, the Town of Montague in Lewis County is not participating in the NFIP. As a result, the economic consequences of Sections 201(d) and 202 of the Flood Disaster Protection Act of 1973 (Public Law 93-234)[62] may apply. Flood insurance is not available in communities that do not participate in the NFIP.

The Towns of Palermo and Williamstown in Oswego County have been suspended from the NFIP as of November 4, 1992.

The effective FIRM dates for each of the participating communities is shown in *Table 8: FIRM Effective Dates*.

Table 8: FIRM Effective Dates (as of August 2016)

County	Community	FIRM Effective Date	Notes
Lewis County (No countywide FIRM)	Lewis, Town of	9/29/1996	
	Martinsburg, Town of	6/19/1985	
	Montague, Town of	N/A	Not participating in NFIP

[62] https://www.gpo.gov/fdsys/pkg/STATUTE-87/pdf/STATUTE-87-Pg975.pdf

Table 8: FIRM Effective Dates (as of August 2016)

County	Community	FIRM Effective Date	Notes
Lewis County (No countywide FIRM)	Osceola, Town of	6/30/1976	
	West Turin, Town of	N/A	Participating in NFIP but not mapped (No SFHA identified)
Madison (No countywide FIRM)	Canastota, Village of	4/15/1988	
	Cazenovia, Town of	6/19/1985	
	Cazenovia, Village	6/19/1985	
	Chittenango, Village of	2/1/1985	
	De Ruyter, Town of	6/8/1984	
	Eaton, Town of	9/10/1984	
	Fenner, Town of	2/5/1986	
	Lenox, Town of	6/3/1988	
	Lincoln, Town of	9/4/1985	
	Munnsville, Village of	4/15/1982	
	Nelson, Town of	10/5/1984	
	Oneida, City of	2/23/2001	
	Smithfield, Town of	4/17/1985	
	Stockbridge, Town of	N/A	Participating in NFIP but not mapped (No SFHA identified)
	Sullivan, Town of	5/15/1986	
	Wampsville, Village of	N/A	Participating in NFIP but not mapped (No SFHA identified)
Oneida	Annsville, Town of	9/27/2013	
	Augusta, Town of	9/27/2013	
	Ava, Town of	9/27/2013	
	Camden, Town of	9/27/2013	
	Camden, Village of	9/27/2013	
	Florence, Town of	9/27/2013	
	Lee, Town of	9/27/2013	
	Oneida Castle, Village of	9/27/2013	
	Rome, City of	9/27/2013	
	Sherrill, City of	9/27/2013	
	Sylvan Beach, Village of	9/27/2013	

Table 8: FIRM Effective Dates (as of August 2016)

County	Community	FIRM Effective Date	Notes
Oneida	Vernon, Town of	9/27/2013	
	Vernon, Village of	9/27/2013	
	Verona, Town of	9/27/2013	
	Vienna, Town of	9/27/2013	
	Westmoreland, Town of	9/27/2013	
Onondaga	Cicero, Town of	11/4/2016	
	Clay, Town of	11/4/2016	
	Dewitt, Town of	11/4/2016	
	East Syracuse, Village of	11/4/2016	
	Fabius, Town of	11/4/2016	
	Fayetteville, Village of	11/4/2016	
	Lafayette, Town of	11/4/2016	
	Manlius, Town of	11/4/2016	
	Manlius, Village of	11/4/2016	
	Minoa, Village of	11/4/2016	
	North Syracuse, Village of	11/4/2016	Participating in NFIP but not mapped (No SFHA identified)
	Pompey, Town of	11/4/2016	
	Salina, Town of	11/4/2016	
	Syracuse, City of	11/4/2016	
Oswego	Amboy, Town of	6/18/2013	
	Central Square, Village of	N/A	Participating in NFIP but not mapped (No SFHA identified)
	Cleveland, Village of	6/18/2013	
	Constantia, Town of	6/18/2013	
	Hastings, Town of	6/18/2013	
	Palermo, Town of	N/A	Suspended from program
	Parish, Town of	6/18/2013	
	Redfield, Town of	6/18/2013	
	Schroeppel, Town of	6/18/2013	
	Volney, Town of	6/18/2013	
	West Monroe, Town of	6/18/2013	
	Williamstown, Town of	N/A	Suspended from program

Letters of Map Change (LOMCs)

Due to limitations in the scale or topographic detail of the source maps used to prepare a FIRM, on occasion, small areas of elevated land may be included in an SFHA. When property owners feel that this has occurred, they may request a Letter of Map Change (LOMC) for their property or structure.

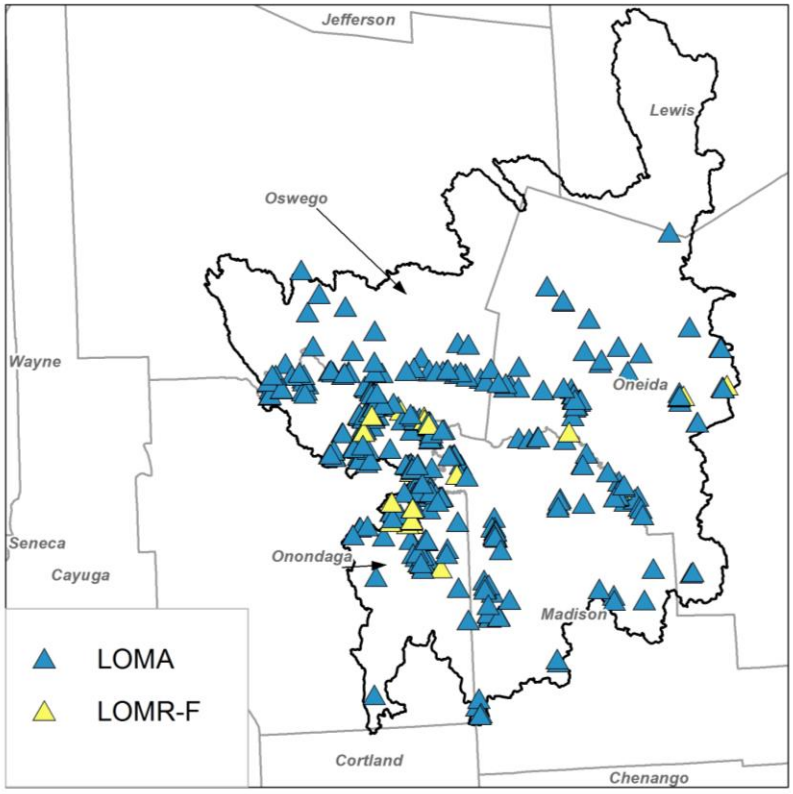

Figure 13: LOMCs in the Oneida Lake Watershed

A LOMC is the general term for a suite of methods FEMA uses to make an official flood hazard determination for a structure or property. The Letter of Map Amendment (LOMA) process, for properties on natural high ground, and the Letter of Map Revision based on Fill (LOMR-F) process, for properties elevated by the placement of fill, are the most common ways used to amend the FIRM. These methods do not physically change the FIRM for a community; rather they amend, *by letter*, the FIRM for the benefit of accurate site information without the cost of publishing a revised FIRM panel. By comparison, a Letter of Map Revision (LOMR) is commonly used by community officials to request FIRM changes stemming from completed development (e.g. the construction of a bridge), flood-control projects (e.g., the construction of a levee), or other larger-scale changes in the floodplain (e.g., the paving of the channel of a stream).

Table 9: LOMCs in the Project Area (as of March 2016) highlights the areas within the Oneida Lake Watershed that have LOMCs. There are a total 513 LOMAs/LOMR-F and no LOMRs located in the watershed. Lewis County has 8 LOMAs/LOMR-Fs, Madison County has 103 LOMAs/LOMR-Fs, Oneida County has 72 LOMAs/LOMR-Fs, Onondaga County has 272 LOMAs/LOMR-Fs, 123 of which are located in the Town of Cicero, and Oswego County has 58 LOMAs/LOMR-Fs.

More information on the LOMA and LOMR-F processes can be found on FEMA's LOMC website.

Table 9: LOMCs in the Project Area (as of March 2016)

County	Community	Number of LOMA/ LOMR-Fs	Number of LOMRs	FIRM Effective Date
Lewis	Lewis, Town of	2	0	9/29/1996
	Martinsburg, Town of	6	0	6/19/1985
	Montague, Town of	N/A	N/A	N/A
	Osceola, Town of	0	0	6/30/1976
	West Turin, Town of	N/A	N/A	N/A
Madison	Canastota, Village of	4	0	4/15/1988
	Cazenovia, Town of	17	0	6/19/1985
	Cazenovia, Village	2	0	6/19/1985
	Chittenango, Village of	21	0	2/1/1985
	De Ruyter, Town of	4	0	6/8/1984
	Eaton, Town of	6	0	9/10/1984
	Fenner, Town of	0	0	2/5/1986
	Lenox, Town of	7	0	6/3/1988
	Lincoln, Town of	0	0	9/4/1985
	Munnsville, Village of	0	0	4/15/1982
	Nelson, Town of	5	0	10/5/1984
	Oneida, City of	10	0	2/23/2001
	Smithfield, Town of	3	0	4/17/1985
	Stockbridge, Town of	N/A	N/A	N/A
	Sullivan, Town of	24	0	5/15/1986
	Wampsville, Village of	N/A	N/A	N/A
Oneida	Annsville, Town of	2	0	9/27/2013
	Augusta, Town of	2	0	9/27/2013
	Ava, Town of	0	0	9/27/2013
	Camden, Town of	2	0	9/27/2013
	Camden, Village of	3	0	9/27/2013
	Florence, Town of	0	0	9/27/2013
	Lee, Town of	3	0	9/27/2013
	Oneida Castle, Village of	1	0	9/27/2013
	Rome, City of	15	0	9/27/2013

Table 9: LOMCs in the Project Area (as of March 2016)

County	Community	Number of LOMA/ LOMR-Fs	Number of LOMRs	FIRM Effective Date
Oneida	Sherrill, City of	3	0	9/27/2013
	Sylvan Beach, Village of	15	0	9/27/2013
	Vernon, Town of	2	0	9/27/2013
	Vernon, Village of	0	0	9/27/2013
	Verona, Town of	7	0	9/27/2013
	Vienna, Town of	17	0	9/27/2013
	Westmoreland, Town of	0	0	9/27/2013
Onondaga	Cicero, Town of	123	0	11/4/2016
	Clay, Town of	23	0	11/4/2016
	Dewitt, Town of	12	0	11/4/2016
	East Syracuse, Village of	5	0	11/4/2016
	Fabius, Town of	1	0	11/4/2016
	Fayetteville, Village of	3	0	11/4/2016
	Lafayette, Town of	1	0	11/4/2016
	Manlius, Town of	59	0	11/4/2016
	Manlius, Village of	16	0	11/4/2016
	Minoa, Village of	4	0	11/4/2016
	North Syracuse, Village of	N/A	N/A	11/4/2016
	Pompey, Town of	2	0	11/4/2016
	Salina, Town of	15	0	11/4/2016
	Syracuse, City of	8	0	11/4/2016
Oswego	Amboy, Town of	0	0	6/18/2013
	Central Square, Village of	N/A	N/A	N/A
	Cleveland, Village of	2	0	6/18/2013
	Constantia, Town of	17	0	6/18/2013
	Hastings, Town of	6	0	6/18/2013
	Palermo, Town of	1	0	N/A
	Parish, Town of	2	0	6/18/2013
	Redfield, Town of	1	0	6/18/2013
	Schroeppel, Town of	19	0	6/18/2013
	Volney, Town of	4	0	6/18/2013
	West Monroe, Town of	6	0	6/18/2013
	Williamstown, Town of	0	0	N/A

Coordinated Needs Management Strategy (CNMS) and NFIP Mapping Needs

The Coordinated Needs Management Strategy (CNMS) is a FEMA initiative to update the way FEMA organizes, stores, and analyzes flood hazard mapping needs information for communities. CNMS defines an approach and structure for the identification and management of flood hazard mapping needs that supports data-driven planning and the flood map update investment process in a geospatial (or GIS) environment. The goal is to identify areas where existing flood maps are not up to FEMA's mapping standards.

There are three classifications within the CNMS: "Valid," "Unverified," and "Unknown." New and updated studies (i.e., those with new hydrologic and hydraulic models) performed during FEMA's Map Modernization program were automatically determined to be "Valid" and the remaining studies went through a 17 element validation process with seven critical and ten secondary elements. Validation elements apply physical, climatological, and environmental factors to stream studies to determine validity. A stream study has to pass all of the critical elements and at least seven secondary elements in order to be classified as "Valid." The remainder of the streams are classified as "Unverified."

The following seven Critical Elements or "checks" must be answered satisfactorily in order for a stream reach to be determined "valid":

- Change in the Gage Record: Has a major flood event caused a major change in gage record since the effective analysis?
- Change in Discharge: Do the updated and effective peak discharges differ significantly based on confidence limit criteria in *FEMA's Guidelines and Specifications* (G&S)?
- Model Methodology: Is the model methodology no longer appropriate based on FEMA's G&S?
- Hydraulic Change: Has a major flood-control structure (dam/levee/floodwall/other change) been added or removed from the reach?
- Channel Reconfiguration: Is the current channel reconfiguration outside the effective SFHA? (Has the stream moved?)
- Other Hydraulic Changes: Have more than five hydraulic structures (bridge/culvert) been added or removed that impact Base Flood Elevations (BFEs) on the reach?
- Channel Area Change: Has there been significant channel fill or scour?

If one or more of the above noted elements are true, then the flood hazard information for the reach is "invalid." Not all elements may be applicable for all flooding sources.

In addition to the seven Critical Elements, if four or more of the following Secondary Elements are true then the flood hazard information must be recorded as "Invalid."

- Regression Equation: Has a rural regression equation been used in a now urbanized area?
- Repetitive Loss: Are there repetitive losses outside the SFHA?
- Impervious Area: Has there been an increase in impervious area in the sub-basin of equal to or greater than 50 percent?

- Hydraulic Structure: Have more than one, but less than five, hydraulic structures (bridge/culvert) been added or removed that impact BFEs on the reach?
- Channel Improvements: Have there been channel improvements or shoreline changes?
- Topography Data: Is better topography and/or bathymetry available?
- Vegetation or Land Use: What changes to vegetation or land use have occurred in the area?
- Coastal Dune: Is there a failure to identify primary frontal dune in coastal areas?
- High Water Mark: Have significant storms occurred with recorded HWMs?
- Regression Equation: Are new regression equations available?

CNMS is a living database that is continuously updated whenever new or revised studies become available. As part of that update, valid stream reaches will be reassessed every 5 years and invalid streams will be prioritized for potential funding. Watershed Discovery meetings provide an opportunity for the gathering and prioritization of CNMS community requests. *Table 10: CNMS Status (as of May 2016)* shows the status of the portions of each county in this project area within the Oneida Lake Watershed *prior* to the Discovery process.

Table 10: CNMS Status (as of May 2016)

County	FIPS	Stream Mileage Within Oneida Lake Watershed			
		Valid	Unverified	Unknown	Total
Lewis	36049C	0	0	28	28
Madison	36053C	4	18	188	210
Oneida	36065C	352	17	0	369
Onondaga	36067C	161	72	7	240
Oswego	36075C	419	19	0	438

Source: FEMA

The CNMS Data Viewer can be accessed online at https://msc.fema.gov/cnms/. More information about CNMS can also be found on FEMA's CNMS webpage at http://www.fema.gov/media-library/assets/documents/21436?id=4628.

Flood Insurance Policies and Claims

A community's agreement to adopt and enforce floodplain management ordinances as part of the NFIP, particularly with respect to new construction, is an important risk reduction element in making federally backed flood insurance available to home and business owners.

As part of this Discovery project, data regarding the NFIP flood insurance policies in the watershed were collected. As of May 2016, 2,448 policies were in-force accounting for $438,041,200 in insurance coverage within the Oneida Lake Watershed. The number of policies and total coverage cost are listed in *Table 11: Flood Insurance Policy and Claims Data (as of March 2016).*

Onondaga County represents 58 percent of the insurance policies (1,434) and 64 percent of the insurance coverage ($284 million) within the communities in the Oneida Lake Watershed. In Onondaga County, the Town of Cicero has 357 policies and over $62 million in coverage. This community has the most policies of any in the watershed.

The communities within the watershed in Lewis County have six flood insurance policies with $1.3 million in insurance coverage. In Madison County, there are 537 policies within the communities in the watershed with $70 million in insurance coverage. In Oneida County, there are 237 policies in communities in the watershed with $43 million in coverage. In Oswego County, there are 234 policies in communities in the watershed with $39 million in coverage.

Table 11: Flood Insurance Policy and Claims Data (as of March 2016)

County	Community	Number of Policies	Total Amount of Coverage	Number of Claims	Total Claims Paid
Lewis	Lewis, Town of	1	$350,000	0	$0
	Martinsburg, Town of	5	$965,100	0	$0
	Montague, Town of	N/A	N/A	N/A	N/A
	Osceola, Town of	0	$0	0	$0
	West Turin, Town of	0	$0	0	$0
Madison	Canastota, Village of	64	$7,012,900	26	$32,935
	Cazenovia, Town of	21	$5,669,300	2	$15,499
	Cazenovia, Village of	15	$2,056,500	12	$64,394
	Chittenango, Village of	151	$18,334,500	57	$143,850
	De Ruyter, Town of	3	$705,000	1	$0
	Eaton, Town of	5	$536,300	0	$0
	Fenner, Town of	2	$87,000	0	$0
	Lenox, Town of	15	$2,687,400	12	$31,621
	Lincoln, Town of	6	$1,099,300	4	$4,932
	Munnsville, Village of	3	$450,400	6	$404,906
	Nelson, Town of	11	$1,968,000	2	$0
	Oneida, City of	123	$11,839,800	126	$3,652,372
	Smithfield, Town of	0	$0	1	$1,371
	Stockbridge, Town of	2	$290,000	1	$ 0
	Sullivan, Town of	116	$18,037,200	59	$745,223

Table 11: Flood Insurance Policy and Claims Data (as of March 2016)

County	Community	Number of Policies	Total Amount of Coverage	Number of Claims	Total Claims Paid
Madison	Wampsville, Village of	0	$0	0	$0
Oneida	Annsville, Town of	3	$630,000	3	$3,696
	Augusta, Town of	2	$65,600	6	$58,270
	Ava, Town of	0	$0	0	$0
	Camden, Town of	4	$1,260,000	0	$0
	Camden, Village of	6	$969,100	2	$668
	Florence, Town of	1	$105,000	0	$0
	Lee, Town of	7	$1,073,000	2	$33,822
	Oneida Castle, Village of	2	$294,600	5	$19,981
	Rome, City of	54	$14,727,900	38	$43,170
	Sherrill, City of	4	$1,606,600	1	$0
	Sylvan Beach, Village of	49	$6,894,800	34	$252,301
	Vernon, Town of	7	$1,248,800	7	$219,347
	Vernon, Village of	1	$280,000	0	$0
	Verona, Town of	27	$3,658,200	16	$90,960
	Vienna, Town of	59	$8,690,400	23	$92,879
	Westmoreland, Town of	11	$1,759,000	14	$69,213
Onondaga	Cicero, Town of	357	$62,615,200	196	$1,375,909
	Clay, Town of	147	$23,020,700	52	$265,438
	Dewitt, Town of	117	$47,579,300	41	$1,428,814
	East Syracuse, Village of	31	$9,712,900	21	$416,455
	Fabius, Town of	4	$454,700	1	$1,037
	Fayetteville, Village of	70	$10,229,800	54	$192,224
	Lafayette, Town of	16	$2,395,400	4	$7,673
	Manlius, Town of	222	$38,933,700	59	$309,586
	Manlius, Village of	51	$11,147,300	15	$38,834
	Minoa, Village of	100	$11,321,200	13	$11,160
	North Syracuse, Village of	5	$1,114,700	0	$0
	Pompey, Town of	23	$5,688,700	12	$91,553
	Salina, Town of	70	$18,962,300	14	$39,007
	Syracuse, City of	221	$40,930,300	144	$590,000

Table 11: Flood Insurance Policy and Claims Data (as of March 2016)

County	Community	Number of Policies	Total Amount of Coverage	Number of Claims	Total Claims Paid
Oswego	Amboy, Town of	4	$303,300	0	$0
	Central Square, Village of	4	$653,700	5	$8,830
	Cleveland, Village of	6	$1,351,600	33	$195,063
	Constantia, Town of	41	$6,094,600	16	$145,089
	Hastings, Town of	48	$8,319,900	8	$36,875
	Palermo, Town of	0	$0	0	$0
	Parish, Town of	2	$560,000	3	$9,937
	Redfield, Town of	5	$412,000	0	$0
	Schroeppel, Town of	65	$9,140,300	21	$45,445
	Volney, Town of	6	$2,056,000	2	$0
	West Monroe, Town of	53	$9,691,900	20	$106,180
	Williamstown, Town of	0	$0	0	$0

Source: FEMA

Repetitive Loss/Severe Repetitive Loss Properties

A Repetitive Loss (RL) is a property that has received two or more claim payments of more than $1,000 from the NFIP within any rolling ten-year period. In the Oneida Lake Watershed, there were 79 repetitive losses within the study area accounting for $3,954,926 in claims paid as of May 2016. The data are shown in *Table 12: Repetitive Losses in Study Area (as of March 2016)*.

A Severe Repetitive Loss (SRL) property is defined as a residential property that is covered under an NFIP flood insurance policy and (a) has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; and (b) for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. For both (a) and (b), at least two of the referenced claims must have occurred within any ten-year period, and must be greater than ten days apart. There is one SRL property in the Oneida Lake Watershed. This property is located in the Village of Sylvan Beach in Oneida County and has a total paid claim amount of $40,471.

Table 12: Repetitive Losses in Study Area (as of March 2016)

County	Community	Number of Repetitive Loss Properties	Total Claims Paid
Lewis	Lewis, Town of	0	0
	Martinsburg, Town of	0	0
	Montague, Town of	0	0
	Osceola, Town of	0	0
	West Turin, Town of	0	0
Madison	Canastota, Village of	1	$9,376
	Cazenovia, Town of	0	0
	Cazenovia, Village	2	$23,773
	Chittenango, Village of	2	$26,844
	De Ruyter, Town of	0	0
	Eaton, Town of	0	0
	Fenner, Town of	0	0
	Lenox, Town of	0	0
	Lincoln, Town of	0	0
	Munnsville, Village of	1	$297,995
	Nelson, Town of	0	0
	Oneida, City of	3	$79,661
	Smithfield, Town of	0	0
	Stockbridge, Town of	0	0
	Sullivan, Town of	6	$285,581
	Wampsville, Village of	0	0
Oneida	Annsville, Town of	0	0
	Augusta, Town of	1	$46,952
	Ava, Town of	0	0
	Camden, Town of	0	0
	Camden, Village of	0	0
	Florence, Town of	0	0
	Lee, Town of	0	0
	Oneida Castle, Village of	1	$19,631
	Rome, City of	1	$3,112
	Sherrill, City of	0	0
	Sylvan Beach, Village of	4	$126,955
	Vernon, Town of	2	$142,268

Table 12: Repetitive Losses in Study Area (as of March 2016)

County	Community	Number of Repetitive Loss Properties	Total Claims Paid
Oneida	Vernon, Village of	0	0
	Verona, Town of	1	$39,679
	Vienna, Town of	2	$22,420
	Westmoreland, Town of	2	$30,967
Onondaga	Cicero, Town of	23	$549,584
	Clay, Town of	0	$0
	Dewitt, Town of	9	$1,975,823
	East Syracuse, Village of	0	$0
	Fabius, Town of	0	$0
	Fayetteville, Village of	0	$0
	Lafayette, Town of	1	$3,949
	Manlius, Town of	2	$38,461
	Manlius, Village of	0	$0
	Minoa, Village of	0	$0
	North Syracuse, Village of	0	$0
	Pompey, Town of	0	$0
	Salina, Town of	1	$15,810
	Syracuse, City of	5	$38,773
Oswego	Amboy, Town of	0	$0
	Central Square, Village of	0	$0
	Cleveland, Village of	0	$0
	Constantia, Town of	2	$51,326
	Hastings, Town of	1	$12,322
	Palermo, Town of	0	$0
	Parish, Town of	0	$0
	Redfield, Town of	0	$0
	Schroeppel, Town of	0	$0
	Volney, Town of	0	$0
	West Monroe, Town of	5	$81,268
	Williamstown, Town of	0	$0

Source: FEMA

Structures that flood frequently strain the NFIP Fund. In fact, RL properties are the biggest draw on the fund. FEMA has paid almost $3.5 billion in claims for RL properties. RL properties not

only increase the NFIP's annual losses and the need for borrowing funds from Congress, but also drain funds needed to prepare for future catastrophic events.

Clusters of RL and previous NFIP assistance are used to identify "hot spot" areas within communities. This information can be used to identify areas of mitigation interest and updated mapping needs and products for individual communities.

Community Assistance Visits (CAVs)

Statewide Community Assistance Visits (CAVs) are part of the evaluation and review process used by FEMA, NYSDEC Floodplain Management staff, and local officials to ensure that each community adequately enforces local floodplain management regulations to remain in compliance with NFIP requirements. Generally, a CAV consists of a tour of the floodplain, an inspection of community permit files, and meetings with local appointed and elected officials. During a CAV, observations and investigations will focus on identifying issues in various areas, such as community floodplain management regulations/ordinances, community administration and enforcement procedures, engineering or other issues related to FIRMs, and other problems related to community floodplain management.

Any administrative problems or potential violations identified during a CAV will be documented in the CAV findings report. The community will be notified and given the opportunity to correct administrative procedures and remedy any violations to the maximum extent possible within established deadlines.

CAVs are also a way to provide technical assistance to communities. If administrative problems or potential violations are identified, the community will be notified and given the opportunity to correct those administrative procedures and remedy the violations to the maximum extent possible within established deadlines. FEMA or the State will work with the community to help bring the program into compliance with NFIP requirements. In extreme cases where the community does not take action to bring itself into compliance, FEMA may initiate an enforcement action against the community. A program deficiency is a defect in a community's floodplain management regulations or administrative procedures that impacts effective implementation of floodplain management regulations of the standards in 44 CFR Sections 60.3, 60.4, or 60.6. "Open" CAVs can be indicative of unresolved violations.

Community Assistance Contacts (CACs)

Community Assistance Contacts (CACs) in the watershed have been more sporadic during the last 20 years. CACs are a tool employed by the State of New York and FEMA to periodically contact a community to see if they are having any difficulties in administering the local floodplain management ordinance or program. A CAC is an additional way of determining if a CAV should be scheduled. CACs are also a means of encouraging Code Enforcement Officers to attend annual floodplain management workshops. CACs can serve to support local officials when they need help to effectively administer the NFIP in their community.

Table 13: CAVs and CACs Performed Within the Project Area (as of March 2016) lists the most recent CAVs and CACs performed for communities located within the project area.

Table 13: CAVs and CACs Performed Within the Project Area (as of March 2016)

County	Community	Most Recent CAV Date	Most Recent CAC Date
Lewis	Lewis, Town of	9/29/1994	9/28/2011
	Martinsburg, Town of	11/4/1991	N/A
	Montague, Town of	N/A	N/A
	Osceola, Town of	9/8/1990	N/A
	West Turin, Town of	N/A	N/A
Madison	Canastota, Village of	N/A	N/A
	Cazenovia, Town of	N/A	1/30/1992
	Cazenovia, Village	N/A	7/20/1993
	Chittenango, Village of	11/15/2010	N/A
	De Ruyter, Town of	N/A	8/8/1995
	Eaton, Town of	N/A	9/11/2015
	Fenner, Town of	9/19/1997	1/30/1992
	Lenox, Town of	2/24/1992	N/A
	Lincoln, Town of	9/19/1997	N/A
	Munnsville, Village of	N/A	N/A
	Nelson, Town of	N/A	1/30/1992
	Oneida, City of	9/16/2015	N/A
	Smithfield, Town of	12/15/1997	3/1/1994
	Stockbridge, Town of	N/A	N/A
	Sullivan, Town of	8/4/1993	N/A
	Wampsville, Village of	N/A	4/18/1996
Oneida	Annsville, Town of	9/26/2014	9/22/2015
	Augusta, Town of	9/4/1990	N/A
	Ava, Town of	N/A	2/9/1995
	Camden, Town of	6/24/1992	N/A
	Camden, Village of	N/A	N/A
	Florence, Town of	8/8/1990	N/A
	Lee, Town of	7/6/1992	N/A
	Oneida Castle, Village of	3/14/1994	7/8/1992
	Rome, City of	7/12/2005	5/7/1997
	Sherrill, City of	5/10/1993	N/A
	Sylvan Beach, Village of	N/A	10/7/1993
	Vernon, Town of	7/24/1995	N/A
	Vernon, Village of	N/A	N/A

Table 13: CAVs and CACs Performed Within the Project Area (as of March 2016)

County	Community	Most Recent CAV Date	Most Recent CAC Date
Oneida	Verona, Town of	9/28/1989	7/12/2001
	Vienna, Town of	7/29/2008	6/20/2014
	Westmoreland, Town of	N/A	N/A
Onondaga	Cicero, Town of	1/29/1992	N/A
	Clay, Town of	8/14/2001	N/A
	Dewitt, Town of	8/20/1997	N/A
	East Syracuse, Village of	N/A	N/A
	Fabius, Town of	N/A	N/A
	Fayetteville, Village of	2/25/1992	N/A
	Lafayette, Town of	9/14/1993	N/A
	Manlius, Town of	9/15/2015	N/A
	Manlius, Village of	N/A	N/A
	Minoa, Village of	N/A	N/A
	North Syracuse, Village of	N/A	N/A
	Pompey, Town of	8/19/1994	N/A
	Salina, Town of	N/A	N/A
	Syracuse, City of	6/27/2006	N/A
Oswego	Amboy, Town of	2/17/2011	8/10/1994
	Central Square, Village of	N/A	N/A
	Cleveland, Village of	7/14/2004	N/A
	Constantia, Town of	5/1/2006	N/A
	Hastings, Town of	N/A	7/19/1993
	Palermo, Town of	3/3/1994	N/A
	Parish, Town of	9/12/1997	N/A
	Redfield, Town of	N/A	N/A
	Schroeppel, Town of	9/28/2015	N/A
	Volney, Town of	N/A	N/A
	West Monroe, Town of	6/21/1995	N/A
	Williamstown, Town of	N/A	9/13/1994

Source: FEMA

Ordinances

The project area's local jurisdictions have a patchwork of regulations regarding development within known SFHAs, ranging from ordinances with minimum NFIP requirements to strong, pro-active ordinances that not only regulate and protect new and improved development in existing

SFHAs, but seek to mitigate the growth of SFHAs caused by increased runoff from developed areas and the degradation of natural flood control areas, such as wetlands and forests. The NFIP uses six different ordinance levels (60.3 land-use classification levels).

The following summarizes the three different ordinance levels New York State uses, and which will be located in the local law for the community.

1. The "A" type should be used when 1-percent-annual-chance floodplains have not yet been identified.

2. The "D" type should be used when 1-percent-annual-chance floodplains without BFEs have been identified; 1-percent-annual-chance floodplains with BFEs, but without floodways have been identified; and 1-percent-annual-chance floodplains with BFEs and a floodway have been identified. If the community also has coastal flooding, but does not have coastal high-hazard areas (V Zones), it is a "D" type.

3. The "E" type should be used when coastal high-hazard areas (V Zones) have been identified.

The NFIP-participating communities within the watershed have floodplain management regulations in place and have a mechanism for updating their ordinances.

Table 14: Program Status and Ordinance Level lists the Program Status and Ordinance Level for each community in the Oneida Lake Watershed.

Table 14: Program Status and Ordinance Level (as of May 2016)

County	Community	Program Status	Ordinance Level	Ordinance Effective Date
Lewis	Lewis, Town of	Regular	D	8/8/1996
	Martinsburg, Town of	Regular	D	6/19/1985
	Montague, Town of	Not Participating	N/A	N/A
	Osceola, Town of	Regular	D	6/30/1976
	West Turin, Town of	Regular	A	7/30/1984
Madison	Canastota, Village of	Regular	D	5/1/1985
	Cazenovia, Town of	Regular	D	6/19/1985
	Cazenovia, Village	Regular	D	6/19/1985
	Chittenango, Village of	Regular	D	2/1/1985
	De Ruyter, Town of	Regular	D	5/2/1994
	Eaton, Town of	Regular	D	3/30/1987
	Fenner, Town of	Regular	D	2/5/1986
	Lenox, Town of	Regular	D	3/18/1987
	Lincoln, Town of	Regular	D	9/4/1985

Table 14: Program Status and Ordinance Level (as of May 2016)

County	Community	Program Status	Ordinance Level	Ordinance Effective Date
Madison	Munnsville, Village of	Regular	D	9/15/1983
	Nelson, Town of	Regular	D	9/15/1983
	Oneida, City of	Regular	D	8/5/1985
	Smithfield, Town of	Regular	D	4/17/1985
	Stockbridge, Town of	Regular	A	3/16/1987
	Sullivan, Town of	Regular	D	4/3/1985
	Wampsville, Village of	Regular	A	1/31/1983
Oneida	Annsville, Town of	Regular	D	8/8/2013
	Augusta, Town of	Regular	D	7/17/2013
	Ava, Town of	Regular	D	6/11/2013
	Camden, Town of	Regular	D	7/8/2013
	Camden, Village of	Regular	D	7/16/2013
	Florence, Town of	Regular	D	6/7/2013
	Lee, Town of	Regular	D	6/11/2013
	Oneida Castle, Village of	Regular	D	8/5/2013
	Rome, City of	Regular	D	8/14/2013
	Sherrill, City of	Regular	D	8/29/2013
	Sylvan Beach, Village of	Regular	D	9/16/2013
	Vernon, Town of	Regular	D	7/8/2013
	Vernon, Village of	Regular	D	9/3/2013
	Verona, Town of	Regular	D	8/5/2013
	Vienna, Town of	Regular	D	8/7/2013
	Westmoreland, Town of	Regular	D	7/8/2013
Onondaga	Cicero, Town of	Regular	D	4/4/1983
	Clay, Town of	Regular	D	4/1/1980
	Dewitt, Town of	Regular	D	3/1/1979
	East Syracuse, Village of	Regular	D	8/3/1981
	Fabius, Town of	Regular	D	4/30/1986
	Fayetteville, Village of	Regular	D	8/2/1982
	Lafayette, Town of	Regular	D	4/3/1985
	Manlius, Town of	Regular	D	2/15/1992
	Manlius, Village of	Regular	D	9/29/1978
	Minoa, Village of	Regular	D	9/2/1982
	North Syracuse, Village of	Regular	A	11/20/1985

Table 14: Program Status and Ordinance Level (as of May 2016)

County	Community	Program Status	Ordinance Level	Ordinance Effective Date
Onondaga	Pompey, Town of	Regular	D	1/3/1979
	Salina, Town of	Regular	D	8/16/1982
	Syracuse, City of	Regular	D	5/3/1982
Oswego	Amboy, Town of	Regular	D	5/7/2013
	Central Square, Village of	Regular	A	5/13/2013
	Cleveland, Village of	Regular	D	5/6/2013
	Constantia, Town of	Regular	D	11/3/1982
	Hastings, Town of	Regular	D	5/14/2013
	Palermo, Town of	Suspended	N/A	N/A
	Parish, Town of	Regular	D	6/13/2013
	Redfield, Town of	Regular	D	5/6/2013
	Schroeppel, Town of	Regular	D	5/9/2013
	Volney, Town of	Regular	D	4/23/2013
	West Monroe, Town of	Regular	D	4/20/2013
	Williamstown, Town of	Suspended	N/A	N/A

Source: FEMA

Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary incentive program that provides flood insurance premium discounts to NFIP-participating communities that take extra measures to manage floodplains above the minimum requirements. A point system is used to determine a CRS rating. The more measures a community takes to minimize or eliminate exposure to floods, the more CRS points are awarded and the higher the discount on flood insurance premiums. As a result, flood insurance premium rates are discounted from 5 to 45 percent to reflect the reduced flood risk resulting from a community's actions to successfully meet the three CRS goals:

1. Reduce flood damage to insurable property;
2. Strengthen and support the insurance aspects of the NFIP; and
3. Encourage a comprehensive approach to floodplain management.

Currently the only community within the Oneida Lake Watershed that participates in CRS is the City of Syracuse in Onondaga County. The City became a Class 8 participating CRS community on May 1, 2010. For more information on CRS, visit FEMA's website at https://www.fema.gov/community-rating-system.

Additional information on the CRS program would be of benefit to all watershed communities to ensure they are fully aware of what the CRS is, if a community is eligible to apply, and what level of effort is required to make CRS participation beneficial for a community. Local communities may wish to consider pooling resources and efforts or work on a countywide basis to ease the level of effort to comply with the requirements of joining the CRS program.

Other Data Useful for Flood Risk Assessment and Mitigation

Topographic Data

Topography is the description of surface shapes and features. Today topographic data is commonly captured using Light Detection and Ranging (LiDAR) techniques. LiDAR is a state-of-the-art method for collecting accurate topographic elevation information using an instrument that measures distance to a reflecting object by emitting timed pulses of laser light and measuring the time between emission and reception of reflected pulses. More information on LiDAR is available on NOAA's website. LiDAR elevation data are only available for some portions of the Oneida Lake Watershed at this time. Information about the coverage of LiDAR data in New York State is available at the NYSGIS Clearinghouse.

Dams

Please refer to the Historic Flooding Problems subsection in Section II of this report for information about dams in the Oneida Lake Watershed.

Levees

A levee or floodwall is defined in the Code of Federal Regulations (CFR), Title 44, Section 59.1 as "a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding".

No specific levees in the Oneida Lake Watershed were identified in data collection efforts as part of this Discovery project.

Stream Gages and Flows

According to the U.S. Geological Survey (USGS), most USGS stream gages operate by measuring the elevation of the water in the river or stream and then converting the water elevation (called "stage") to a stream flow ("discharge") by using a curve that relates the elevation to a set of actual discharge measurements.

The USGS standard is to measure river stage to 0.01 inches. This is accomplished by the use of floats inside a stilling well, by the use of pressure transducers that measure how much pressure is required to push a gas bubble through a tube (related to the depth of water), or with radar. *Figure 14: Typical Modern USGS Stream Gage* illustrates the design of a river gaging station.

At most USGS stream gages, the stage is measured every 15 minutes and the data are stored in an electronic data recorder. At set intervals, usually between every one to four hours, the data are transmitted to the USGS using satellite, phone, or radio. At the USGS offices, the curves relating stage to stream flow are applied to determine stream flow estimates and both the stage and stream flow data are then displayed on the USGS website. For more information on how stream gages work, please see the USGS's factsheet on stream gaging.

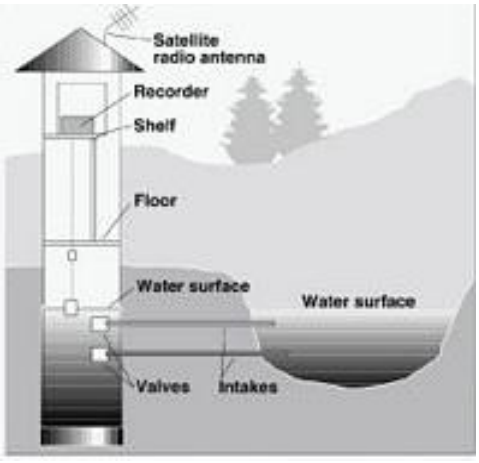

Figure 14: Typical Modern USGS Stream Gage

There are six known current and past gages in the watershed. *Table 15: USGS Gages in the Oneida Lake Watershed* shows the gage identification number, location, drainage area, status, and county for all USGS gages identified in the watershed. Additional information on gages in the watershed may be found by visiting the USGS's website.

Table 15: USGS Gages in the Oneida Lake Watershed

Gage ID	Gage Location	Drainage Area (sq. miles)	Gage Status	County
04242500	East Branch Fish Creek at Taberg, NY	186	Active	Oneida
04243500	Oneida Creek at Oneida, NY	116	Active	Oneida
04245000	Limestone Creek at Fayetteville, NY	86	Inactive	Onondaga
04245200	Butternut Creek near Jamesville, NY	33	Active	Onondaga
04246500	Oneida River at Caughdenoy, NY	1,365	Inactive	Oswego
04247000	Oneida River near Euclid, NY	1,440	Active	Oswego

Rain Gages

The National Oceanic and Atmospheric Administration's (NOAA) Cooperative Observer Program is a weather and climate observing network of more than 11,000 volunteers who take observations nationwide on farms, in urban and suburban areas, National Parks, seashores, and mountaintops. When appropriate, FEMA will utilize the NOAA information from these gages in developing meteorological models for the watershed that will employ rainfall runoff models and calibration.

Additional information on rainfall in New York can be found in NOAA Technical Paper No. 49 and in the Technical Memorandum NWS HYDRO-35, both on NOAA's website. It should be noted that data has been updated through a joint collaboration between the National Resources Conservation Service (NRCS) and the Northeast Regional Climate Center (NRCC) and is available at the Extreme Precipitation in New York and New England webpage.

Average Annualized Loss (AAL) Data

The Average Annualized Loss (AAL) data provide a general understanding of the dollar losses associated with a certain flood event frequency within a county and are used to get a relative comparison of flood risk. It is determined by using FEMA's Multi-Hazard Risk Assessment and Loss Estimation Program, otherwise known as Hazus-MH.

The Hazus Flood Model analyzes both riverine and coastal flood hazards. Flood hazard is defined by a relationship between depth of flooding and the annual chance of inundation to that depth. Probabilistic events are modeled by looking at the damage caused by an event that is likely to occur over a given period of time, known as a return period or recurrence interval (10-, 25-, 50-, 100-, and 500-year). Annualized losses are the summation of losses over all return periods multiplied by the probability of occurrence. Loss estimation for this Hazus module is based on specific input data. The first type of data includes square footage of buildings for specified types or population. The second type of data includes information on the local economy that is used in estimating losses.

AAL data summarized at the census block level are shown on the Discovery Maps and provided in tabular form in Appendix J. Total losses for the communities included in the Oneida Lake Watershed are estimated at over $35 million for AAL.

Municipal Separate Storm Sewer Systems (MS4s)

As noted on the NYSDEC's website, Federal Stormwater Phase II regulations require permits for stormwater discharges from MS4s in urban areas and for construction activities that disturb one or more acres of land. To implement the law, NYSDEC has developed two general permits, one for MS4s in urbanized areas and one for construction activities. The permits are part of the State Pollutant Discharge Elimination System (SPDES). Operators of regulated MS4s and operators of construction activities must obtain permit coverage under either an individual SPDES permit or one of the general permits prior to commencement of construction.

Guidance for local officials on complying with State and Federal stormwater management requirements, Minimum Measures 4 and 5, can be found on the NYSDEC's website. Detailed maps that depict where the regulated MS4 boundaries lie can be also found on the NYSDEC's website.

Oneida County is in the Utica Urbanized Area, which includes 13 active regulated MS4 communities that are subject to regulation by NYSDEC and are required to develop Stormwater Management Plans. Sustainable methods to mitigate flooding and stem stormwater runoff are being undertaken in several communities within the County. These practices include:

- Preserving and restoring natural landscape features;
- Reducing amount of land covered by impervious surface;
- Green roofs;
- Rain gardens;
- Vegetated swales; and
- Planters and stream buffers.

Onondaga County is in the Syracuse Urbanized Area, which includes 32 active regulated MS4 communities that are subject to regulation by NYSDEC, and are required to develop Stormwater Management Plans. Green infrastructure practices to mitigate flooding and stem stormwater runoff are being undertaken in several communities within the County. These practices include:

- Green roofs;
- Rain gardens;
- Permeable pavement;
- Bio-swales or vegetated swales;
- Rain barrels; and
- Cisterns.

Transportation

Transportation is the movement of people and goods from location to location. These features include roads, rail, and air. Planning for these features allows for utilization and function within communities and interaction with other communities. They are the backbone of economies and diversity. These features are critical for community planning related to risk assessments for evacuation routes and potential flooding issues that could occur. Transportation features were obtained from the New York State GIS Clearinghouse.

Jurisdictional Boundaries

Jurisdictional boundaries used for this Discovery project, including boundaries for cities, towns, villages, and counties, were also obtained from the New York State GIS Clearinghouse.

Hazard Mitigation Planning and Activities

Summary of Hazard Mitigation Plans

A local HMP is a long-term strategic/guidance document used by an entity to reduce future risk to life, property, and the economy in a community. The purpose of the HMP is to:

- Identify vulnerabilities to natural hazards and provide for potential projects to reduce those vulnerabilities in the future;
- Protect life, safety, and property by reducing the potential for future damages and economic losses that result from natural hazards;
- Qualify for additional grant funding, in both the pre-disaster and post-disaster environment;
- Speed recovery and redevelopment following future disaster events;
- Demonstrate a firm local commitment to hazard mitigation principles; and
- Comply with both State and Federal legislative requirements for local HMPs.

As of July 2016, 32 communities within the watershed had approved HMPs. The New York State Division of Homeland Security and Emergency Services (NYSDHES) reviews the local HMPs prior to FEMA review and approval. These plans identify potential hazards and threats that face

each community. Subsequent to approval and adoption of the HMPs, the communities are eligible to receive grants for future mitigation projects through the Hazard Mitigation Grant Program. There are numerous advantages to mitigation. The creation of a mitigation plan helps local officials identify potential future hazards. Once the threats are identified, the communities can identify mitigation activities, projects, and strategies to eliminate or minimize the impact a potential hazard would cause. Preventative measures are also cost effective; preventing the impact of a hazard will cost less than cleaning up after a disaster occurs. Mitigation can prevent the loss of lives as well as property damage. These plans focus on the exposure of critical facilities and community-owned assets to potential hazards and address ways to reduce the vulnerability to these threats. Some of these actions, projects, and strategies may take little time to employ while others may take years to implement.

HMPs are often completed at the county or regional level. At the local level, each municipal government also adopts the HMP as an individual plan or regional plan. Each municipality that adopts the HMP must develop specific mitigation actions to address vulnerabilities. Each municipal HMP was reviewed for initiatives, critical facilities, and mitigation actions. The status of approved HMPs is shown in *Table 16: Approved Hazard Mitigation Plans (as of July 2016).* Communities without a current HMP, such as communities in Madison County and Lewis County, are in the process of updating their plan.

Table 16: Approved Hazard Mitigation Plans (as of July 2016)

County	Community	Approval Date	Plan Expiration
Lewis (Plan Expired)	Lewis, Town of	3/18/2011	PLAN EXPIRED 3/18/2016, NEW PLAN IN PROGRESS
	Martinsburg, Town of	3/18/2011	PLAN EXPIRED 3/18/2016, NEW PLAN IN PROGRESS
	Montague, Town of	3/18/2011	PLAN EXPIRED 3/18/2016, NEW PLAN IN PROGRESS
	Osceola, Town of	3/18/2011	PLAN EXPIRED 3/18/2016, NEW PLAN IN PROGRESS
	West Turin, Town of	3/18/2011	PLAN EXPIRED 3/18/2016, NEW PLAN IN PROGRESS
Madison (Plan Expired)	Canastota, Village of	9/17/2008	PLAN EXPIRED 9/18/2013, NEW PLAN IN PROGRESS
	Cazenovia, Town of		
	Cazenovia, Village of		

Table 16: Approved Hazard Mitigation Plans (as of July 2016)

County	Community	Approval Date	Plan Expiration
Madison (Plan Expired)	Chittenango, Village of	9/17/2008	PLAN EXPIRED 9/18/2013, NEW PLAN IN PROGRESS
	DeRuyter, Town of		
	Eaton, Town of		
	Fenner, Town of		
	Lenox, Town of		
	Lincoln, Town of		
	Munnsville, Village of		
	Nelson, Town of		
	Oneida, City of		
	Smithfield, Town of		
	Stockbridge, Town of		
	Sullivan, Town of		
	Wampsville, Town of		
Oneida (County HMP approved 8/21/2014)	Annsville, Town of	8/21/2014	8/21/2019
	Augusta, Town of	8/21/2014	8/21/2019
	Ava, Town of	8/21/2014	8/21/2019
	Camden, Town of	8/21/2014	8/21/2019
	Camden, Village of	8/21/2014	8/21/2019
	Florence, Town of	8/21/2014	8/21/2019
	Lee, Town of	8/21/2014	8/21/2019
	Oneida Castle, Village of	8/21/2014	8/21/2019
	Rome, City of	8/21/2014	8/21/2019
	Sherrill, City of	8/21/2014	8/21/2019
	Sylvan Beach, Village of	8/21/2014	8/21/2019
	Vernon, Town of	8/21/2014	8/21/2019
	Vernon, Village of	8/21/2014	8/21/2019
	Verona, Town of	8/21/2014	8/21/2019
	Vienna, Town of	8/21/2014	8/21/2019
	Westmoreland, Town of	8/21/2014	8/21/2019
Onondaga (County HMP approved 12/6/2012)	Cicero, Town of	Did not adopt plan	
	Clay, Town of	Did not adopt plan	
	Dewitt, Town of	12/6/2012	12/6/2017

Table 16: Approved Hazard Mitigation Plans (as of July 2016)

County	Community	Approval Date	Plan Expiration
Onondaga (County HMP approved 12/6/2012)	East Syracuse, Village of	Did not adopt plan	
	Fabius, Town of	Did not adopt plan	
	Fayetteville, Village of	Did not adopt plan	
	Lafayette, Town of	Did not adopt plan	
	Manlius, Town of	12/6/2012	12/6/2017
	Manlius, Village of	12/6/2012	12/6/2017
	Minoa, Village of	12/6/2012	12/6/2017
	North Syracuse, Village of	Did not adopt plan	
	Pompey, Town of	Did not adopt plan	
	Salina, Town of	Did not adopt plan	
	Syracuse, City of	12/6/2012	12/6/2017
Oswego (County HMP approved 4/12/2013)	Amboy, Town of	4/12/2013	4/12/2018
	Central Square, Town of	4/12/2013	4/12/2018
	Cleveland, Village of	Did not adopt plan	
	Constantia, Town of	4/12/2013	4/12/2018
	Hastings, Town of	4/12/2013	4/12/2018
	Palermo, Town of	Did not adopt plan	
	Parish, Town of	4/12/2013	4/12/2018
	Redfield, Town of	4/12/2013	4/12/2018
	Schroeppel, Town of	Did not adopt plan	
	Volney, Town of	4/12/2013	4/12/2018
	West Monroe, Town of	Did not adopt plan	
	Williamstown, Town of	Did not adopt plan	

Source: *Lewis County Hazard Mitigation Plan, Madison County Hazard Mitigation Plan, Oneida County Hazard Mitigation Plan, Onondaga County Hazard Mitigation Plan, Oswego County Hazard Mitigation Plan*

Critical Facilities and Other Important Properties in the SFHA

Critical facilities are those entities essential to the community's health and welfare. Critical facilities included in the HMPs vary based on how the locality defines a critical facility/infrastructure and the types of data available. Typically, critical facilities are defined as

community assets whose presence is vital to that jurisdiction's continued ability to operate. Critical facilities often include 911 and emergency services facilities, airports, colleges and universities, schools, fire departments, police departments, sewage treatment plants, hospitals and nursing homes.

Table 17: Critical Facilities and Infrastructure Noted in HMPs as at Risk of Flooding

County	Community	Facilities Located within SFHA
Lewis	HMP is expired	HMP is expired
Madison	HMP is expired	HMP is expired
Oneida	Town of Annsville	Wastewater Treatment Plant
	Town of Camden	Wastewater Treatment Plant
	City of Rome	There are 3 schools and 1 wastewater treatment plant facility located in the flood zone.
	Town of Vienna	A portion of the Town's highway facility is in the flood zone.
Onondaga	Town of Cicero	Brewerton Fire Department
	Town of Clay	O.C.C School
	Town of Dewitt	Dewitt Town Hall and Police Department
	Town of Fabius	Tully Elementary School
	Town of Manlius	COR East Substation, Shining Stars Day Care, Colonial Village Apartments, Alterra Wynwood of Manlius
	City of Syracuse	2 police stations, 2 fire stations, SFD Station 18, Madrasat Al Ihsan, 6 schools
Oswego	All	Specific statistics for critical facilities in the floodplain not included in report.

Source: *Lewis County Hazard Mitigation Plan, Madison County Hazard Mitigation Plan, Oneida County Hazard Mitigation Plan, Onondaga County Hazard Mitigation Plan, Oswego County Hazard Mitigation Plan*

Hazard Mitigation Grants

FEMA provides funding for various types of mitigation projects. These funds are granted through several mechanisms including the Pre-Disaster Mitigation Grant Program (PDM), Hazard Mitigation Grant Program (HMGP), and Flood Mitigation Assistance (FMA).

The PDM program provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event to states, territories, and Tribal governments (and through them, local communities). Funding these plans and projects reduces overall risks to residents and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds.

Like PDM, the HMGP provides grants to states (who may then award funding to local governments), to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented state-wide during the immediate recovery from a disaster.

Lastly, the FMA provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the NFIP on an annual basis through three types of grants: Planning Grants to prepare flood mitigation plans; Project Grants to implement measures to reduce flood losses, such as elevation, acquisition or relocation of NFIP-insured structures; and Management Cost Grants so that the grantee may administer the FMA program and activities. FMA grants are only available to state (and state-equivalent) and Tribal governments; however, local governments may be named as sub-applicants.

Mitigation Projects Completed or Underway

The community HMPs identified mitigation projects, actions, and strategies to reduce long-term vulnerability to hazards. Each county listed several mitigation projects related to reducing flood risk. The general mitigation planning approach used is based on the FEMA Publication *"Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies"*[63]. The FEMA document contains four steps used to support mitigation planning:

- Develop mitigation goals and objectives
- Identify and prioritize mitigation actions
- Prepare an implementation strategy
- Document the mitigation planning process

Lewis County

Lewis County's HMP mitigation strategies include:

- Promote disaster resistant development
- Reduce possibility of damage and losses due to ice jams, flooding, and dam failure
- Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.

Municipal projects to implement these strategies include:

- Undertaking a survey of critical and emergency facilities
- Ensuring compliance with City of Rome dam regulations
- Rehabilitating and replacing culverts
- Installing new storm sewers and a drainage system
- Purchasing land outside the floodplain to relocate a sewage treatment plant
- Updating flood hazard mapping for the Black River area

[63] *Onondaga County Hazard Mitigation Plan*

Madison County

Madison County's HMP does not include overall mitigation strategies. Though the plan is currently expired, specific mitigation measures included:

- Property buyouts of repetitive loss structures
- GIS mapping of flood hazard areas of high hazard dams
- Countywide stream maintenance program
- County Highway Department infrastructure inventory and mapping, and local zoning restriction on 100-year floodplain construction

At the time of preparation of the HMPs, several drainage projects in the Towns of Smithfield, Sullivan, and Madison, and City of Oneida were underway to maintain drainage ditches and upgrade culverts.

Oneida County

Oneida County's HMP focuses on several strategies, including:

- Protect public health, life, and safety
- Enable Oneida County residents to remain eligible for post-disaster federal funding
- Protect property, improve disaster readiness, protect environmental resources on public land, historical structures, private homes and businesses, and critical infrastructure throughout Oneida County.
- Increase public awareness about disaster preparedness

The HMP states that these strategies will likely require the following mitigation projects:

- Stabilize eroding dam damaged by June 2013 storm events
- Right-sizing culverts and infrastructure
- Proper land use planning and zoning
- Floodplain and riparian protection and restoration
- Stream management based on sound science and methodology[64].

The most common mitigation strategies address flooding and stormwater runoff. Other priorities include the need for improved outreach to vulnerable residents, improved cooperation among local disaster preparedness, and upgrades to emergency response equipment. A key accomplishment since 2008 includes property acquisition of flooded homes in the Town of Westmoreland.

A high priority mitigation project in Oneida County includes the property acquisition for Dixon Trailer Park in the Town of Vernon.

Onondaga County

Onondaga County's mitigation strategies include:

- Protect life and property

[64] *Oneida County Hazard Mitigation Plan*

- Increase understanding of hazard risk and public awareness and preparedness
- Promote sustainability throughout the County
- Promote and support partnerships
- Enhance disaster preparedness, response, and recovery

Municipal mitigation actions and projects to implement the above strategies include:

- Stream gage/flood forecasting project along canal system with USGS and NWS
- Work with existing agencies and organizations to develop open space strategies and conservation standards to be met by new development projects
- Support retrofitting of structures located in hazard-prone areas

Oswego County

Oswego County and participating municipalities developed several mitigation goals and strategies. These include:

- Increase community education and disaster preparedness
- Encourage partnerships and mutual aid agreements
- Provide for public health and safety
- Protect the environment, private property, and community facilities
- Improve countywide communication systems and transportation infrastructure

Municipal mitigation actions and projects to implement the above strategies include:

- Property protection: establish programs and funds to purchase houses located within the floodplain or with frequent flooding issues
- Coordinate with USACE regarding ways to reduce Oneida Lake flooding issues affected by Barge Canal system
- Establish break wall on Oneida Lake for safety of waterway
- Emergency services: provide training to emergency response personnel to handle hazard events, inventory emergency shelters and critical facilities
- Structural projects: dams, levees, floodwalls, and safe rooms.

IV. Discovery Outreach and Engagement Strategy

Prior Engagement Efforts

Prior outreach and engagement efforts related to flood risk (separate from this Discovery project) have been performed by NYSDEC and FEMA for certain communities within the Oneida Lake Watershed recently. These projects and activities are summarized in the table below.

Table 18: Prior Engagement Efforts in Project Area

County	Name of Project	Project Outreach and Engagement Efforts
Lewis	Lake Ontario Contributing Watershed Discovery Project	• Initial project stakeholder webinars held in August and September 2013; • Initial stakeholder meetings held in November 2013; Project completed and reports delivered to FEMA in August 2016.
Madison	None	N/A
Oneida	Oneida County Countywide FIRM Project	• Initial stakeholder meetings held August 2007. Map effective date September 27, 2013.
Onondaga	Lake Ontario Contributing Watershed Discovery Project (Very limited area affected)	• Initial project stakeholder webinars held in August and September 2013; • Initial stakeholder meetings held in November 2013. Project completed and reports delivered to FEMA in August 2016.
Onondaga	Seneca Watershed Discovery Project	• Initial project stakeholder webinars held in April 2014; • Initial stakeholder meetings held in May 2014. Project completed and reports delivered to FEMA in June 2015.
Onondaga	Onondaga County Countywide FIRM Project	• Initial stakeholder meetings held December 2001. Map effective date November 4, 2016.
Oswego	Lake Ontario Contributing Watershed Discovery Project	• Initial project stakeholder webinars held in August and September 2013; • Initial stakeholder meetings held in November 2013. Project completed and reports delivered to FEMA in August 2016.
Oswego	Oswego County Countywide FIRM Project	• Initial stakeholder meetings held May 2007. Map effective date June, 18, 2013.

Stakeholder Identification

As part of this Discovery process for the Oneida Lake Watershed, the NYSDEC Floodplain Management Section compiled an extensive list of contact information for community officials and other stakeholders within the watershed. In an effort to gather as much local feedback as possible, over 560 watershed stakeholders including local officials from individual communities and counties, representatives from Federal and State agencies, non-governmental organizations, and other local groups were invited to participate in the Discovery process.

Key Stakeholder Groups and Influencers

In addition to municipal officials, planning and emergency agencies, and local residents, there are other stakeholders with an interest in floodplain mapping and management: Other Federal and State agencies, major landowners, large employers, academic institutions, and environmental organizations all have a role to play, and sometimes valuable information to provide, when developing both pre-mapping data and final mapping products. Examples of such organizations in the Oneida Lake Watershed include:

- Cornell Cooperative Extension
- SUNY College of Environmental Science & Forestry
- USACE, Buffalo District
- USGS New York Water Science Center
- New York State Canal Corporation
- Syracuse University
- Nature Conservancy
- Oneida Lake Association
- Tug Hill Commission
- Oneida Lake and Watershed Advisory Council
- Farm Bureau of New York

Pre-Meeting Engagement and Information Exchange

Exchanging information with key stakeholders is a critical part of the Oneida Lake Watershed Discovery project. There were two primary goals of the initial outreach and engagement activities associated with this project: 1) to communicate the purpose of the Discovery project and the role of local stakeholder input in the process and 2) to obtain key information upfront related to existing flood risk in the watershed, flood hazard mapping needs, mitigation activities, and other existing information useful in updating the FIRMs.

Pre-Discovery Webinars

The project team conducted two Pre-Discovery webinar sessions on April 5th and 7th, 2016, via WebEx/conference call for the Oneida Lake Watershed. The purpose of the sessions was to introduce the planning team, explain the Discovery process and how it can benefit the communities in the watershed; and how stakeholders can participate in the process. The sessions

were also used to obtain input on best locations for in-person Discovery Meetings, who should be included in the process, and ideas for encouraging participation in the meetings.

Correspondence/Survey Form

Prior to the webinars, an Oneida Lake Watershed Risk MAP Discovery Project Stakeholder Survey was sent to all stakeholders invited to the webinars. The survey was available online via Survey Monkey. Digital PDF copies of the survey were also provided. Stakeholders were asked to submit the survey no later than May 6th, 2016 in order for the Discovery team to gather and develop preliminary materials for the in-person Discovery meetings. The survey gathered information from stakeholders on:

- Flood mapping needs, FIRM inaccuracies, and historical flood problems
- High water marks within the community
- Community planning, ongoing projects, and recent residential, commercial, or industrial development
- Flood mitigation activities
- Training needs
- NFIP and floodplain management information
- GIS data: base map data, engineering data, and risk assessment data
- Other community officials or groups to include in the Discovery project

The list of identified stakeholders used for pre-meeting engagement communications is provided in Appendix A of this report.

V. Discovery Meetings

The purpose of the in-person Discovery meetings is to review any information previously provided by communities, State and regional agencies, and local stakeholders; discuss each community's floodplain mapping needs and floodplain management activities, mitigation plans and projects, and flood risk concerns; and gather additional feedback for FEMA to consider when developing Risk MAP products, including the development of new FIRMs where needed.

Appendices to this report include the Discovery meeting preparation and meeting materials:

- Meeting Invitation
- Meeting Invitation Mailing List
- Meeting Agenda
- Meeting Sign-In sheets
- Meeting Presentations
- Meeting Summary Memorandum

Invitees to the in-person Discovery meetings, included not only those stakeholders initially identified to participate in the Pre-Discovery webinars, but also other stakeholders identified by participants during the Pre-Discovery webinars and in the completed Discovery Stakeholder Survey forms received prior to the meetings. Invitations were sent by e-mail and hard copy. Additionally, phone calls to communities who had not RSVP'd for the meetings were made the week prior to the meetings to encourage attendance.

A series of five in-person meetings in the Oneida Lake Watershed were held at the dates and times listed below.

Table 19: Oneida Lake Watershed Discovery Meetings

Date	Time	County	Location
5/24/2016	1:30 PM - 4:00 PM	Madison County	Madison County Emergency Operations Center 138 North Court Street Wampsville, NY 13163
5/25/2016	9:00 AM - 11:30 AM	Oneida County	Village of Sylvan Beach Office 808 Marina Drive Sylvan Beach, NY 13157
5/25/2016	1:30 PM - 4:00 PM	Oswego County	Village of Cleveland Village Hall 2 Clay Street Cleveland, NY 13042
5/26/2016	9:00 AM - 11:30 AM	Onondaga County	Town of Manlius Office 301 Brooklea Drive Fayetteville, NY 13066

Table 19: Oneida Lake Watershed Discovery Meetings

Date	Time	County	Location
5/26/2016	2:30 PM - 5:00 PM	Lewis County	Lewis County Cornell Cooperative Extension 5274 Outer Stowe Street Lowville, NY 13367

Community officials and other stakeholders who attended the Discovery meetings were interviewed by project team members on a variety of flood and mitigation-related topics. Of particular importance to the project was the identification of mapping, training, and mitigation needs in the watershed. This information was captured in copies of the Discovery Stakeholder Survey form by project team members and on scoping maps created by NYSDEC for each community and county. The map allowed stakeholders to pinpoint flooding hot spot areas, locations of past, ongoing, or desired mitigation projects, and areas with mapping needs.

Post-Meeting Follow Up Activities

Additional outreach to communities in the Oneida Lake Watershed was performed after the meetings. Follow up letters were sent to communities that had not participated in the Discovery process to date (i.e., did not submit a Stakeholder Survey Form or attend one of the Discovery meetings) that again requested their input in the process. For communities that did participate in the process, letters summarizing the mapping needs identified by their communities were sent to the relevant community officials to ensure their needs were correctly summarized. The letter requested that community officials review the summarized needs and either return a signed copy of the letter to NYSDEC if the needs were summarized correctly or contact NYSDEC if changes were needed. Copies of the community acknowledgment letters sent are provided in Appendix I.

VI. Discovery Findings

Summary of Stakeholder Comments and Needs

Following the completion of the Discovery meetings, the information gathered during the face-to-face consultations with community officials and other watershed stakeholders was combined with additional information provided by stakeholders through the Discovery Stakeholder Survey forms completed in hard copy or online outside of the meetings. A summary of identified needs related to flood mapping, mitigation, and training are provided in the sections below based on the information provided by stakeholders during the Discovery process.

Additionally, detailed summaries of the data provided by stakeholders during the project are available in the following appendices to this report:

- Appendix H: Discovery Meeting Summary Memorandum
- Appendix M: Community Requests and Floodplain Mapping Priorities Summary Memorandum
- Appendix N: Watershed Recommended Scope of Work Memorandum

Flood Mapping Needs

Communities in the Oneida Lake Watershed have a mix of updated digital countywide FIRMs and older community based, paper FIRMs developed between 1976 and 2001. While communities in Oneida and Oswego Counties have updated countywide FIRMs and communities in Onondaga County have updated preliminary mapping scheduled to become effective in November 2016, communities in Madison and Lewis Counties would benefit from a modernized countywide FIRM in a digital format. Based on stakeholder input received during this project, it was made clear that many community officials find the existing maps very difficult to work with. In particular, stakeholders noted it is challenging to locate structures on these maps accurately. Many of the communities, particularly in Madison County, noted there is growth along major water bodies.

Beyond the upgrade of mapping for Lewis and Madison County to a digital format, specific stream restudy priorities were also identified based on the data gathered and stakeholder input provided during this Discovery project. A total of 25 separate detailed riverine/lake study mapping needs were identified by watershed stakeholders. There were also several stream study requests for flooding sources outside of the project area. *Table 20* summarizes all of the mapping needs identified by communities and other stakeholders during the project. The Discovery Maps prepared for the Oneida Lake Watershed show the locations of the identified mapping needs. A detailed summary of community requests and floodplain mapping priorities is also provided in Appendix M.

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
Lewis	Lewis, Town of	9/29/1996	No needs identified
	Martinsburg, Town of	6/19/1985	No needs identified
	Montague, Town of	N/A	No needs identified
	Osceola, Town of	6/30/1976	No needs identified
	West Turin, Town of	N/A	No needs identified
	Lewis County	N/A	No specific inaccuracies noted but a digital product and model-backed approximate floodplains would be useful.
Madison	Canastota, Village of	4/15/1988	A new detailed study for unnamed tributary to Canastota Creek (from Village line to the confluence with Canastota Creek) is needed. It is the main flooding source that affects the village and has not yet been studied.
	Cazenovia, Town of	6/19/1985	No needs identified
	Cazenovia, Village	6/19/1985	No needs identified
	Chittenango, Village of	2/1/1985	1. An updated detailed study for Chittenango Creek is needed. Multiple bridge and culvert replacements have occurred since the last study. There is also a LOMC cluster in the Valley Acres subdivision. The current flood hazard information shown is not accurate. 2. A new detailed study for the unnamed tributary to Chittenango Creek south of West Genesee Street is needed. This flooding source currently has an approximate study, the floodplain boundaries of which are not accurate.
	De Ruyter, Town of	6/8/1984	No needs identified
	Eaton, Town of	9/10/1984	No needs identified
	Fenner, Town of	2/5/1986	No needs identified
	Lenox, Town of	6/3/1988	1. An updated detailed study for Oneida Lake is needed due to recent development and regular seasonal flooding. 2. A new detailed study for the Tributary to Erie Canal north of Seneca Turnpike is needed. This flooding source currently has an

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
Madison			approximate study, and recent residential development has occurred. The current floodplain is overstated. 3. An updated detailed study for Cowaselon Creek is needed. Flooding occurs in this area and the current study is outdated. 4. The Town has conducted a flood study along Main Street for Canastota Creek due to past flooding issues. This flood study should be reviewed for possible incorporation into the FIRM.
	Lincoln, Town of	9/4/1985	1. Clockville Creek is badly in need of a new detailed study. Residential development is occurring in this area. This flooding source is currently mapped as an approximate floodplain and the boundaries are not accurate. There is a narrow valley at risk from flooding and landslides. 2. Cowaselon Creek is in need of a new detailed study. The current approximate floodplain is not accurate.
	Munnsville, Village of	4/15/1982	No needs identified
	Nelson, Town of	10/5/1984	No needs identified
	Oneida, City of	2/23/2001	1. The unnamed tributary to Higinbotham Brook south of Cleveland Avenue is in need of a new detailed study. This area is being developed and it currently has an approximate study. 2. Higinbotham Brook is in need of an updated detailed study. Recent drainage improvements, including retention facilities, have occurred. 3. Oneida Creek is in need of an updated detailed study. Mitigation options are being considered for this

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
Madison	Oneida, City of	2/23/2001	flooding source - a railroad bridge is too small and a berm may be removed. 4. Cowaselon Creek Reach 2 (from Canal Road to eastern corporate limits) is in need of an updated detailed study. There is a proposed new industrial development along this stream. 5. Cowaselon Creek Reach 1 (from western corporate limits to 1,155 feet upstream to Canal Road)) is in need of a new detailed study. However, there is no development pressure in this area. This is a NYSDEC-owned wetland. Digital FIRMs would be very helpful to have. There is also a discrepancy in the political boundary on the FIRM. The stream that serves as the City/County boundary has been relocated.
	Smithfield, Town of	4/17/1985	No needs identified
	Stockbridge, Town of	N/A	No needs identified
	Sullivan, Town of	5/15/1986	1. North Chittenango Creek in the northwest corner of town needs an updated detailed study. 2. Oneida Lake needs an updated detailed study. There is floodway development pressure and an existing restudy on the Onondaga County side of the lake.
	Wampsville, Village of	N/A	No needs identified
	Madison County	N/A	FIRMs date back to the early 1980s. Digital format is badly needed, although the maps are not necessarily inaccurate.

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
Oneida	Annsville, Town of	9/27/2013	1. East Branch Fish Creek is in need of an updated detailed study. The current floodplain boundaries are not accurate. 2. Fish Creek needs an updated detailed study. The stream has moved and the floodplain boundaries are not accurate. 3. West Branch Fish Creek needs an updated detailed study. The stream has migrated and the current floodplain is overstated. 4. Green Brook is not currently studied at all but has flooding problems and needs a new detailed study.
	Augusta, Town of	9/27/2013	1. A new detailed study for Tributary to Sconondoa Creek (East of Herney Road) in the Hamlet of Knoxboro is needed. This is currently an approximate study and is a hot spot flooding area in the town. A mapping error on the current FIRM was also noted in the vicinity of Knoxboro Road that needs to be corrected – the stream is not included within the mapped floodplain. 2. A new detailed study for Sconondoa Creek is needed. This is currently an approximate study – there are significant flooding issues in this area and the stream has shifted course.
	Ava, Town of	9/27/2013	No needs identified
	Camden, Town of	9/27/2013	A new detailed study for West Branch Fish Creek (south of Van Buren Road to the western corporate limits) is needed. There has been development along this stream. The current study is approximate and the floodplain boundaries are not accurate. Base Flood Elevations are needed.

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
Oneida	Camden, Village of	9/27/2013	A new detailed study for West Branch Fish Creek (south of Van Buren Road to the western corporate limits) is needed. There has been development along this stream. The current study is approximate and the floodplain boundaries are not accurate. Base Flood Elevations are needed.
	Florence, Town of	9/27/2013	No needs identified
	Lee, Town of	9/27/2013	No needs identified
	Oneida Castle, Village of	9/27/2013	No needs identified
	Rome, City of	9/27/2013	No needs identified
	Sherrill, City of	9/27/2013	No needs identified
	Sylvan Beach, Village of	9/27/2013	A revised detailed study is needed for Fish Creek which is the main area for repeat flooding in the village.
	Vernon, Town of	9/27/2013	No needs identified
	Vernon, Village of	9/27/2013	No needs identified
	Verona, Town of	9/27/2013	1. Flood hazards along Brandy Brook are much larger than stated due to beaver dams. 2. Flood hazards along Stony Creek are much larger than stated due to beaver dams.
	Vienna, Town of	9/27/2013	An updated detailed study for Fish Creek is needed. The floodway shown is inaccurate and the Route 13 bridge causes ice jams.
	Westmoreland, Town of	9/27/2013	No needs identified
	Oneida County	9/27/2013	There are many creeks/streams that have flood zones with no BFEs associated with them. Additionally, the spatial accuracy of those same flood zones is questionable. Clarification of BFEs and a more accurate picture of the inundation area would help the citizens near these flood areas.

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
Onondaga	Cicero, Town of	11/4/2016	1. Oneida Lake needs an updated detailed study. Recent lakeshore development has occurred. 2. Mud Creek Reach 1 needs an updated detailed study. There are erosion issues present and recent development pressures.
	Clay, Town of	11/4/2016	An updated detailed study is needed for Willow Stream. Townhouses near the stream were mapped into the floodplain in the 1980s but development was planned before the mapping study.
	Dewitt, Town of	11/4/2016	Ley Creek floodplain may be understated, as there is industrial/dense residential development in the area.
	East Syracuse, Village of	11/4/2016	No needs identified
	Fabius, Town of	11/4/2016	No needs identified
	Fayetteville, Village of	11/4/2016	No needs identified
	Lafayette, Town of	11/4/2016	The floodplain for Cascades Creek is overstated on the FIRM and needs an updated detailed study.
	Manlius, Town of	11/4/2016	Area in the vicinity of Schepps Corner Road is prone to flooding from Limestone Creek.
	Manlius, Village of	11/4/2016	No needs identified
	Minoa, Village of	11/4/2016	No needs identified
	North Syracuse, Village of	11/4/2016	No needs identified
	Pompey, Town of	11/4/2016	No needs identified
	Salina, Town of	11/4/2016	1. Bloody Brook needs an updated detailed study. A remediation project is underway from the confluence with Onondaga Lake to Route 148 that will widen and deepen the channel which will have an impact on the floodplain and residential structures in the vicinity. 2. Ley Creek needs an updated detailed study. A remediation project is also planned for this flooding source.
	Syracuse, City of	11/4/2016	No needs identified

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
Onondaga	Onondaga County	11/4/2016	No needs identified
Oswego	Amboy, Town of	6/18/2013	1. A new detailed study of Panther Lake is needed. Development has occurred in this area. 2. A new detailed study of Carterville Pond is needed. Development has occurred in this area.
	Central Square, Village of	N/A	No needs identified
	Cleveland, Village of	6/18/2013	No needs identified
	Constantia, Town of	6/18/2013	No needs identified
	Hastings, Town of	6/18/2013	No needs identified
	Palermo, Town of	N/A	No needs identified
	Parish, Town of	6/18/2013	No needs identified
	Redfield, Town of	6/18/2013	No needs identified
	Schroeppel, Town of	6/18/2013	No needs identified
	Volney, Town of	6/18/2013	No needs identified
	West Monroe, Town of	6/18/2013	No needs identified
	Williamstown, Town of	N/A	No needs identified
	Oswego County	6/18/2013	1. Oneida River (from Oneida Lake to Schroeppel and at County Route 10 crossing) is in need of an updated detailed study due to new development. 2. Bay Creek in southwestern Central Square needs an updated detailed study. This area is close to schools. 3. Various culvert sizes within the county need to be correctly reflected in the FIRM and Flood Insurance Study/flood modeling.
NYSDEC Regional Office	N/A	N/A	1. The county boundary between the Village of Oneida Castle (Oneida County) and the City of Oneida (Madison County) for the area immediately south of NYS Route 5 (aka Seneca Avenue) is not shown correctly on the 2013 Oneida County FIRM. The area is part of Madison County (City of Oneida) and not

Table 20: Summary of Mapping Needs Identified by Municipalities/Counties

County	Community	FIRM Effective Date	Mapping Needs Identified by Municipalities/Counties
NYSDEC Regional Office	N/A	N/A	Oneida County (Village of Oneida Castle). 2. The floodplain for a tributary of Sconondoa Creek in the Town of Augusta, northwest of the intersection of Knoxboro Road and North Road does not follow the stream channel. The stream, in a culvert, crosses North Road about 90 feet south of its mapped location on the 2013 Oneida County FIRM.

Mitigation and Risk Reduction Project Needs

Communities and other stakeholders provided their input on mitigation and risk reduction project needs as part of the Discovery project. The most common needs identified included the replacement/resizing of culverts and bridges, dam maintenance/remediation, and assistance to mitigate beaver dams along flooding sources that exacerbate flooding problems. *Table 21* provides a summary of such needs identified by communities and stakeholders during this Discovery project.

Table 21: Summary of Mitigation and Risk Reduction Projects Needs

County	Community	Mitigation and Risk Reduction Project Needs Identified
Lewis	Lewis, Town of	No needs identified
	Martinsburg, Town of	No needs identified
	Montague, Town of	No needs identified
	Osceola, Town of	No needs identified
	West Turin, Town of	No needs identified
	Lewis County	No needs identified
Madison	Canastota, Village of	Development is increasing fill in the ditch by South Main Street south of Route 5.
	Cazenovia, Town of	No needs identified
	Cazenovia, Village	No needs identified
	Chittenango, Village of	No needs identified
	De Ruyter, Town of	No needs identified
	Eaton, Town of	No needs identified
	Fenner, Town of	No needs identified
	Lenox, Town of	No needs identified
	Lincoln, Town of	No needs identified

County	Community	Mitigation and Risk Reduction Project Needs Identified
Madison	Munnsville, Village of	No needs identified
	Nelson, Town of	No needs identified
	Oneida, City of	Mitigation options are being considered for Oneida Creek - a railroad bridge is too small and a berm may need to be removed. There is a plan to mitigate the water treatment plant located in the floodplain.
	Smithfield, Town of	No needs identified
	Stockbridge, Town of	No needs identified
	Sullivan, Town of	No needs identified
	Wampsville, Village of	No needs identified
	Madison County	No needs identified
Oneida	Annsville, Town of	No needs identified
	Augusta, Town of	Flooding from the Tributary to Sconondoa Creek in the Hamlet of Knoxboro has been prone to flooding for 40 years – need to replace the culvert under North Road. The town would like to meet with a FEMA/NYSDEC representative at the site of floodprone areas to develop mitigation options. The town is interested in getting more information about ways they can acquire funding for mitigation projects on private property.
	Ava, Town of	No needs identified
	Camden, Town of	There are two dams in the Village of Camden. A mill building along Fish Creek near one of the dams has been removed, which may have an impact on the floodway. There is also some undermining of the dam occurring. The dam owner is unknown.
	Camden, Village of	There are two dams in the Village of Camden. A mill building along Fish Creek near one of the dams has been removed, which may have an impact on the floodway. There is also some undermining of the dam occurring. The dam owner is unknown.
	Florence, Town of	No needs identified
	Lee, Town of	No needs identified
	Oneida Castle, Village of	No needs identified
	Rome, City of	No needs identified
	Sherrill, City of	No needs identified
	Sylvan Beach, Village of	No needs identified
	Vernon, Town of	No needs identified
	Vernon, Village of	No needs identified

County	Community	Mitigation and Risk Reduction Project Needs Identified
Oneida	Verona, Town of	The Town has a problem with beaver dams exacerbating flood hazards.
	Vienna, Town of	The Route 13 bridge over Fish Creek is undersized and causes ice jams.
	Westmoreland, Town of	No needs identified
	Oneida County	No needs identified
Onondaga	Cicero, Town of	Mud Creek has some erosion issues along its bank in the vicinity of Rosewood Circle.
	Clay, Town of	No needs identified
	Dewitt, Town of	No needs identified
	East Syracuse, Village of	No needs identified
	Fabius, Town of	Grant programs and outreach measures would be beneficial.
	Fayetteville, Village of	The village clears out Limestone Creek every 2 years with NYSDEC assistance.
	Lafayette, Town of	No needs identified
	Manlius, Town of	No needs identified
	Manlius, Village of	No needs identified
	Minoa, Village of	No needs identified
	North Syracuse, Village of	No needs identified
	Pompey, Town of	No needs identified
	Salina, Town of	No needs identified
	Syracuse, City of	No needs identified
	Onondaga County	No needs identified
Oswego	Amboy, Town of	There has been repeated nuisance flooding due to beaver dams.
	Central Square, Village of	No needs identified
	Cleveland, Village of	No needs identified
	Constantia, Town of	A dam (built in 1930/1940) near Route 49 has a new owner. The dam is in poor condition and needs maintenance work performed. Dam has been overtopped by about one foot of water. Ponds are older and have been filled in with sediment over the years.
	Hastings, Town of	No needs identified
	Palermo, Town of	No needs identified
	Parish, Town of	No needs identified
	Redfield, Town of	No needs identified
	Schroeppel, Town of	No needs identified
	Volney, Town of	No needs identified
	West Monroe, Town of	No needs identified

County	Community	Mitigation and Risk Reduction Project Needs Identified
Oswego	Williamstown, Town of	No needs identified
	Oswego County	No needs identified
NYSDEC Regional Office	N/A	There are many streams in remote areas that have substantial beaver populations. In some cases, the streams are a continuous succession of beaver dams and ponds impounding significant quantities of water.
Oneida Lake Association		Stream bank and riparian buffer zone conservation easements should be enabled via some long term program, and associated with fisheries habitat enhancement and invasive species removal to re-establish native vegetation to hold banks - e.g. muck farms north of Canastota that dump tons of soil and onions into the lake, or trees that float down other creeks to shoal in the lake as navigation hazards - need interagency ad hoc team to identify, mark, and remove these trees (no one agency has jurisdiction or program).

Training, Outreach, and Planning Support Needs

In terms of training, outreach, and planning support needs, Floodplain Management Administration was the most commonly requested training topic by community officials. Training on Building Code Requirements, Hazard Mitigation and Grant Programs, and Effective Public Outreach was also requested by many communities. Training on FEMA tools and products including the FEMA Map Service Center, regulatory floodways, and the NFIP were also identified as needs. *Table 22* provides a summary of the training, outreach, and planning support needs identified by communities and stakeholders during this Discovery project.

Table 22: Summary of Training Needs Identified by Municipalities/Counties

County	Community	Floodplain Management Administration	Building Code Requirements	Hazard Mitigation and Grant Programs	Effective Public Outreach	Other
Lewis	Lewis, Town of	-	-	-	-	-
	Martinsburg, Town of	-	-	-	-	-
	Montague, Town of	-	-	-	-	-
	Osceola, Town of	-	-	-	-	-
	West Turin, Town of	-	-	-	-	-
Madison	Canastota, Village of	-	-	-	-	Flood insurance; Flood mitigation
	Cazenovia, Town of	-	-	-	-	-

Table 22: Summary of Training Needs Identified by Municipalities/Counties

County	Community	Floodplain Management Administration	Building Code Requirements	Hazard Mitigation and Grant Programs	Effective Public Outreach	Other
Madison	Cazenovia, Village of	-	-	-	-	-
	Chittenango, Village of	**X**	**X**	**X**	**X**	-
	De Ruyter, Town of	-	-	-	-	-
	Eaton, Town of	-	-	-	-	-
	Fenner, Town of	-	-	-	-	-
	Lenox, Town of	**X**	**X**	**X**	**X**	-
	Lincoln, Town of	**X**	-	**X**	-	-
	Munnsville, Village of	-	-	-	-	-
	Nelson, Town of	-	-	-	-	-
	Oneida, City of	-	-	-	**X**	-
	Smithfield, Town of	-	-	-	-	-
	Stockbridge, Town of	-	-	-	-	-
	Sullivan, Town of	**X**	**X**	-	-	-
	Wampsville, Village of	-	-	-	-	-
	Madison County	**X**	-	-	-	NFIP
Oneida	Annsville, Town of	-	-	-	-	Floodway information; State compliance requirements
	Augusta, Town of	**X**	**X**	**X**	**X**	-
	Ava, Town of	-	-	-	-	-
	Camden, Town of	-	-	**X**	**X**	-

Table 22: Summary of Training Needs Identified by Municipalities/Counties

County	Community	Floodplain Management Administration	Building Code Requirements	Hazard Mitigation and Grant Programs	Effective Public Outreach	Other
Oneida	Camden, Village of	-	-	**X**	**X**	-
	Florence, Town of	-	-	-	-	-
	Lee, Town of	-	-	-	-	-
	Oneida Castle, Village of	-	-	-	-	-
	Rome, City of	**X**	-	**X**	-	-
	Sherrill, City of	-	-	-	-	-
	Sylvan Beach, Village of	-	-	-	**X**	Building permit process (for public, especially seasonal residents)
	Vernon, Town of	-	-	-	-	-
	Vernon, Village of	-	-	-	-	-
	Verona, Town of	-	**X**	**X**	**X**	-
	Vienna, Town of	**X**	**X**	-	**X**	Training for residents about propane tank requirements and building codes
	Westmoreland, Town of	**X**	**X**	**X**	**X**	-
	Oneida County	**X**	-	**X**	**X**	Individual and Public Assistance Programs; 406 requirements
Onondaga	Cicero, Town of	**X**	**X**	-	-	-
	Clay, Town of	-	-	-	-	-
	Dewitt, Town of	**X**	-	-	-	-
	East Syracuse, Village of	-	-	-	-	-

Table 22: Summary of Training Needs Identified by Municipalities/Counties

County	Community	Floodplain Management Administration	Building Code Requirements	Hazard Mitigation and Grant Programs	Effective Public Outreach	Other
Onondaga	Fabius, Town of	X	X	X	-	-
	Fayetteville, Village of	X	-	-	-	-
	Lafayette, Town of	-	-	X	-	-
	Manlius, Town of	X	X	X	X	FEMA tools and products, Map Service Center
	Manlius, Village of	-	-	-	-	-
	Minoa, Village of	-	-	-	-	-
	North Syracuse, Village of	-	-	-	-	-
	Pompey, Town of	X	X	X	X	-
	Salina, Town of	-	-	-	-	NFIP
	Syracuse, City of	-	-	-	-	-
Oswego	Amboy, Town of	X	X	X	X	-
	Central Square, Village of	-	-	-	-	-
	Cleveland, Village of	X	X	-	-	-
	Constantia, Town of	X	X	-	-	-
	Hastings, Town of	-	-	-	-	-
	Palermo, Town of	-	-	-	-	-
	Parish, Town of	-	-	-	-	-
	Redfield, Town of	-	-	-	-	-
	Schroeppel, Town of	-	-	-	-	-
	Volney, Town of	-	-	-	-	-
	West Monroe, Town of	-	-	-	-	-

Table 22: Summary of Training Needs Identified by Municipalities/Counties

County	Community	Floodplain Management Administration	Building Code Requirements	Hazard Mitigation and Grant Programs	Effective Public Outreach	Other
Oswego	Williamstown, Town of	-	-	-	-	-
	Oswego County	**X**	**X**	**X**	-	Individual and Public Assistance Programs; Stream maintenance for municipalities

Recommendations for Future Risk MAP Project Scope

Based on the stakeholder input and other data collected during this Discovery project, a recommended scope of work was developed for consideration for a future Risk MAP project that may be implemented by FEMA if available funding permits. In addition to upgrading existing detailed and approximate mapping in both Lewis and Madison Counties to a digital format, ten high priority new or revised detailed riverine and lake studies, seven medium priority detailed riverine studies, and eight lower priority detailed studies were also identified as desirable for inclusion in a future Risk MAP project scope.

High priority detailed studies were recommended for the following flooding sources:

- Fish Creek
- East and West Branches of Fish Creek
- Oneida Lake
- Unnamed Tributary to Sconondoa Creek
- Unnamed Tributary to Canastota Creek
- Clockville Creek
- Cowaselon Creek
- Carterville Pond
- Panther Lake

These new detailed studies, combined with updated approximate studies in a new digital format, would assist both the communities and the counties in the Oneida Lake Watershed in effectively enforcing floodplain regulations and managing development, thereby significantly reducing flood risk within the watershed.

The complete recommended scope of work for the Oneida Lake Watershed is provided in Appendix N.