

# Discovery Report

## Lake Ontario – Lower Genesee Watershed, HUC 04130003

Genesee, Livingston, Monroe, Ontario, Orleans, Steuben, and Wyoming 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 Lower Genesee Watershed in the State of New York.*

*Report Number 01  
July 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 Lower Genesee Watershed. While all communities may be under consideration for a revised Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) and/or Flood Insurance Rate Map (FIRM), it is important to note that not all communities will receive new/updated FEMA FISs or FIRMs as a result of the watershed discovery project.

### Genesee County

Batavia, City of\*  
Batavia, Town of\*  
Bergen, Town of  
Bergen, Village of  
Bethany, Town of\*  
Byron, Town of\*  
Elba, Town of\*  
Le Roy, Town of  
Le Roy, Village of  
Pavilion, Town of  
Stafford, Town of\*

### Livingston County

Avon, Town of  
Avon, Village of  
Caledonia, Town of  
Caledonia, Village of  
Conesus, Town of  
Geneseo, Town of\*  
Geneseo, Village of  
Groveland, Town of\*  
Leicester, Town of\*  
Leicester, Village of  
Lima, Town of  
Lima, Village of  
Livonia, Town of  
Livonia, Village of  
*Mount Morris, Town of\*\**

### Livingston County

(cont'd)

Sparta, Town of\*  
Springwater, Town of\*  
York, Town of

### Monroe County

Brighton, Town of\*  
Chili, Town of  
Churchville, Village of  
Gates, Town of\*  
*Greece, Town of\*\**  
Henrietta, Town of\*  
Honeoye Falls, Village of  
Irondequoit, Town of\*  
Mendon, Town of\*  
Ogden, Town of\*  
*Pittsford, Town of\*\**  
Riga, Town of  
Rochester, City of\*  
Rush, Town of  
Scottsville, Village of  
Sweden, Town of\*  
Wheatland, Town of

### Ontario County

*Bristol, Town of\*\**  
Canadice, Town of  
*East Bloomfield, Town of\*\**  
Naples, Town of\*  
Richmond, Town of  
South Bristol, Town of\*  
West Bloomfield, Town of\*

### Orleans County

*Clarendon, Town of\**

### Steuben County

*Wayland, Town of\*\**

### Wyoming County

*Castile, Town of\**  
Covington, Town of  
Gainesville, Town of\*  
Middlebury, Town of\*  
Orangeville, Town of\*  
Perry, Town of\*  
*Silver Springs, Village of\*\**  
Warsaw, Town of\*  
Warsaw, Village of  
*Wethersfield, Town of\*\**  
Wyoming, Village of

\*Partially within the Lower Genesee Watershed

\*\**Partially within the Lower Genesee 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

It should be noted that the information and data presented in this report are static and were current as June 2014.

For the Lower Genesee watershed, the Discovery process began in the summer of 2013. Data collection, as detailed in Table 8, was completed in August 2013. The in-person meetings were held in November 2013. Additional details on meetings and stakeholder involvement can be found in Section IV of this report. Data collected in this report were available prior to August 2013. As applicable, dates of data creation are noted throughout the report.

# Table of Contents

Acronyms and Abbreviations .....	vii
Glossary of Terms.....	ix
Executive Summary .....	1
Introduction.....	3
I. Discovery Overview .....	19
Great Lakes Coastal Flood Study .....	19
Coastal Barriers Resources System .....	21
Coastal Zone Protection Structures.....	22
Stakeholder Coordination .....	22
Pre-Discovery Meetings (via WebEx).....	22
Other Stakeholders.....	23
II. Lower Genesee Watershed Overview.....	23
Geography.....	23
Property Ownership .....	24
Demographics .....	26
Land Use .....	26
III. Summary of Data Analysis .....	28
Data That Can Be Used for Flood Risk Products .....	29
Average Annualized Loss (AAL) Data.....	29
Gage Data.....	31
Stream Gages .....	31
Rain Gages .....	33
Water Level Observations Network.....	33
Levees .....	33
Dams .....	34
Watershed Boundaries .....	35
Bathymetry.....	36
Jurisdictional Boundaries.....	36
Shoreline Change Information.....	37
Streamlines/Hydrograph .....	37

Topography .....	37
Transportation .....	38
Other Data and Information .....	38
Biennial Report .....	38
Regulatory Mapping .....	38
Ordinances .....	41
Flood Insurance Policies .....	43
Letters of Map Change (LOMC) .....	47
Community Assistance Visits (CAVs) .....	49
Community Assistance Contacts (CACs) .....	50
Community Rating System (CRS) .....	52
Repetitive Loss/Severe Repetitive Loss Properties .....	52
Historical Flooding .....	54
Declared Disasters .....	59
High Water Marks .....	61
Ice Jams .....	61
Hazard Mitigation Plans .....	62
Status of Approved Mitigation Plans .....	63
Critical Facilities and Infrastructures .....	65
Mitigation Projects .....	67
Municipal Separate Storm Sewer Systems (MS4s) .....	68
CNMS and NFIP Mapping Needs .....	69
Discovery Meetings - Community Discussion of Needs .....	71
IV. Discovery Meetings .....	71
Webinars .....	72
In-Person Meetings .....	72
Discovery Process Outcomes .....	74
V. Risk MAP Projects and Needs .....	97
Coastal Studies .....	97
Mitigation Projects .....	98
Compliance .....	98
Coastal Special Flood Hazard Areas .....	98
Building Requirements in VE Zones .....	99

Limit of Moderate Wave Action.....	99
Communication.....	102
Unmet Needs.....	102
VI. Conclusion .....	102
VII. Deliverables .....	104
VIII. References.....	105
IX. Appendices.....	106
X. Attachments .....	107

## Figures

Figure 1: Watersheds Included Within the Lake Ontario Discovery Project .....	21
Figure 2: Lower Genesee Watershed Communities .....	24
Figure 3: Typical Modern USGS Stream Gage .....	31
Figure 4: Lower Genesee Watershed Stream Gages.....	32
Figure 5: Dams in the Lower Genesee Watershed.....	35
Figure 6: Lower Genesee Watershed .....	36
Figure 7: Location of LOMCs in the Lower Genesee Watershed .....	49
Figure 8: Limit of Moderate Wave Action .....	100
Figure 9: Example FIRM showing LiMWA.....	101

## Tables

Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities .....	4
Table 2: Summary of Potential Data Sources .....	15
Table 3: Community Training Requests .....	17
Table 4: Links to County Real Property Webpages.....	26
Table 5: Approximate 2010 Population in the Lower Genesee Watershed .....	26
Table 6: Links to County Land Use .....	27
Table 7: U.S. Census 2010 and USDA Census of Agriculture 2007.....	27
Table 8: Data Collected for the Lower Genesee Watershed.....	28
Table 9: 2010 Hazus-MH AAL Data for Lower Genesee Watershed .....	30
Table 10: Stream Gage Stations.....	32
Table 11: Dams in the Lower Genesee Watershed.....	34
Table 12: Lower Genesee Watershed .....	35
Table 13: FIRM/FIS Effective Dates (as of August 2013) .....	39
Table 14: Program Status and Ordinance Level (as of August 2013) .....	41
Table 15: Flood Insurance Policy and Claims Data (as of August 2013).....	44
Table 16: LOMCs in the Project Area (as of August 2013) .....	47
Table 17: CAVs and CACs Performed Within the Project Area (as of September 2013) .....	50
Table 18: Repetitive Losses in Study Area (as of April 2015) .....	53
Table 19: FIS Historical Flooding Areas .....	54
Table 20: Hazard Mitigation Plan Significant Flood Events .....	56
Table 21: Disaster Declarations (as of August 2013) .....	59

Table 22: Approved Hazard Mitigation Plans (as of June 2013).....	63
Table 23: Critical Facilities and Infrastructure at risk of Flooding in the Lower Genesee Watershed (as of June 2013).....	65
Table 24: Current Status of CNMS (as of August 2013).....	70
Table 25: Community Meeting Information.....	73
Table 26: Summary of Community Floodplain Mapping Needs.....	76

## **Appendices**

Appendix A: <i>Pre-Discovery Mailing List and Invitation Letter</i>
Appendix B: <i>Pre-Discovery Stakeholder Meetings</i>
Appendix C: <i>Kickoff Meeting Notes</i>
Appendix D: <i>Other Stakeholders in the Lower Genesee Watershed</i>
Appendix E: <i>Discovery Meeting Agenda</i>
Appendix F: <i>Discovery Meeting Sign-In sheets</i>
Appendix G: <i>Discovery Meeting Presentation</i>
Appendix H: <i>Discovery Meeting Data Worksheets and Stream Matrices</i>
Appendix I: <i>Community Acknowledgement Letters</i>
Appendix J: <i>Community Ordinances</i>
Appendix K: <i>FEMA Hazus-MH Average Annualized Loss (AAL)</i>
Appendix L: <i>Dams and Floodplain Structures</i>
Appendix M: <i>FEMA Public Assistance Funding</i>
Appendix N: <i>Watershed Summary Memorandums</i>
Appendix O: <i>Lower Genesee Watershed Recommended Scope of Work</i>

## **Attachments**

Attachment 1: <i>Substantial Improvement/Substantial Damage Desk Reference</i> , FEMA Publication
Attachment 2: <i>Floodplain Construction Requirements in New York State</i> , NYSDEC Information Sheet
Attachment 3: <i>Levee Certification vs. Accreditation</i> , FEMA Fact Sheet
Attachment 4: <i>LOMA-LOMR-F</i> , FEMA Fact Sheet
Attachment 5: <i>Joining the CRS Program</i> , FEMA Fact Sheet
Attachment 6: <i>Coordinated Needs Management Strategy (CNMS)</i> , FEMA Fact Sheet

## Acronyms and Abbreviations

AAL	Average Annualized Loss
BFE	Base Flood Elevation
CAC	Community Assistance Contact
CAV	Community Assistance Visit
CBRS	Coastal Barrier Resources System
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CID	Community Identification Number
CIS	Community Information System
CNMS	Coordinated Needs Management Strategy
CRS	Community Rating System
DMA2K	Disaster Mitigation Act of 2000 (DMA2K)
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Map
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FIPS	Federal Information Processing Standard
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
GLCFS	Great Lakes Coastal Flood Study
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
LiMWA	Limit of Moderate Wave Action
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



NAVD88	North American Vertical Datum of 1988
NDBC	National Data Buoy Center
NFIP	National Flood Insurance Program
NGVD29	National Geodetic Vertical Datum of 1929
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
NYSOEM	New York State Office of Emergency Management (*as part of NYSDHSES)
PDM	Pre-Disaster Mitigation
RAMPP	Risk Assessment, Mapping, and Planning Partners
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). ([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 Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. An approximate study is represented on a FIRM by 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:** 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](#))

**Bathymetry:** The underwater equivalent to topography. The data used to make bathymetric maps today typically comes from an echosounder ([sonar](#)) mounted beneath or over the side of a boat, “pinging” a beam of sound downward at the underwater surface, or from remote sensing systems. The bathymetry is combined into a seamless digital elevation model/terrain and is used to determine the offshore component for the overland wave analysis/coastal hazard analysis.

**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 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 Base Flood Elevations (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](#))

**FIRM panel:** The FIRM may include one or more individual maps. Each map is called a panel. The number of panels depends on the community size and the scale(s) of the panels. The index is used to determine which panel should be utilized to obtain flood hazard information for a specific location. ([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](#))

**Geocode:** Geocoding is the process of transforming a description of a location—such as a pair of coordinates, an address, or a name of a place—to a location on the earth’s surface. You can geocode by entering one location description at a time or by providing many of them at once in a table. The resulting locations are output as geographic features with attributes, which can be used for mapping or spatial analysis. ([ArcGIS Resource Center](#))

**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 Geographic Information Systems (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](#))

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**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 branch of science and technology concerned with the conveyance or control of liquid flow through pipes and channels, especially as a source of mechanical force.

**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](#))

**Large Culvert:** A culvert with a span between 5 feet and 20 feet which carries a state highway. ([New York State Department of Transportation](#))

**Light Detection and Ranging (LiDAR):** LiDAR is an active remote sensing technique similar to radar, but uses light pulses instead of radio waves. LiDAR is typically “flown” or collected from planes and produces a rapid collection of points (more than 70,000 per second) over a large collection area. Collection of elevation data using LiDAR has several advantages over most other techniques. Chief among them are higher resolutions, centimeter accuracies, and penetration in forested terrain. ([NOAA](#))

**Letter of Map Amendment (LOMA):** A LOMA is an official amendment, by letter, to an effective National Flood Insurance Program (NFIP) map. A LOMA establishes a property’s

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

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 Base Flood Elevation (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 Letter of Map Amendment (LOMA), Letter of Map Revision (LOMR), and Letter of Map Revision based on Fill (LOMR-F). ([FEMA](#))

**Letter of Map Revision (LOMR):** is FEMA's modification to an effective Flood Insurance Rate Map (FIRM), or Flood Boundary and Floodway Map (FBFM), or both. 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 Base Flood Elevations (BFEs), or the Special Flood Hazard Area (SFHA). The LOMR officially revises the Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM), and sometimes the Flood Insurance Study (FIS) report, and when appropriate, includes a description of the modifications. The LOMR is generally accompanied by an annotated copy of the affected portions of the FIRM, FBFM, or FIS report. ([FEMA](#))

**Letter of Map Revision Based on Fill (LOMR-F):** A LOMR-F is FEMA's modification of the Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (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](#))

**Limit of Moderate Wave Action (LiMWA):** The inland limit of the area expected to receive 1.5- to less than 3 foot breaking waves during the 1-percent-annual-chance flood event. The area between this inland limit and the V zone boundary is known as the Coastal A zone. ([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 Flood Insurance Rate Maps. ([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. Acceptable 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 National Flood Insurance Program (NFIP) within any rolling 10-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) grant program:** The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968, to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss structures insured under the National Flood Insurance Program. ([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](#))

**Vertical Datum:** A vertical datum is a base measurement point (or set of points) from which all elevations of points on the Earth's surface are determined. Without a common datum, surveyors would calculate different elevation values for the same location. Vertical datums are either tidal, that is, based on [sea levels](#), or geodetic, based on the same ellipsoid models of the earth used for computing horizontal datums. Common vertical datums used on Flood Insurance Rate Maps (FIRMs) are NGVD29 (tidal) and NAVD88 (geodetic). ([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) Lake Ontario Discovery Reports provide users with a comprehensive understanding of historical flood risk, existing riverine and coastal data, and current flood mitigation activities within the Lake Ontario basin in New York. This includes the Lower Genesee Watershed highlighted in this report. The report also summarizes FEMA's ongoing coastal flood hazard study under FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) program and the Great Lakes Coastal Flood Study (GLCFS) project.

FEMA, in coordination with the New York State Department of Environmental Conservation (NYSDEC), carried out Discovery in the Lake Ontario watersheds. The Discovery process for Lake Ontario involved significant basin-wide data collection and outreach efforts with Lake Ontario 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 have input into 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 Lower Genesee Watershed during the Discovery phase can be found in Section III: *Summary of Data Analysis*.

In addition to collecting information about mapping needs and existing data sources, the Discovery project also discussed mitigation activities within each watershed. Local Hazard Mitigation Plans (HMPs) were reviewed to better understand existing flood risks within Lake Ontario communities. These plans are developed as part of the local planning process and are primarily multi-jurisdictional. Stakeholders provided limited information about ongoing mitigation activities in the watershed, and several 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 Data Analysis* 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 Lower Genesee Watershed Discovery project was developed. The Lower Genesee Watershed consists of portions of five counties, only one of which has digital maps. The Watershed is made up of 56 communities. Many communities in the four counties that still have the older paper Flood Insurance Rate Maps (FIRMs) developed during the 1970s and 1980s. Community officials find these older FIRMs difficult to use and their primary request is for updated digital mapping. Monroe County has FIRMs in a digital format with updated approximate studies. A select few detailed stream segments were updated during the 2008 Monroe County map revision. A number of communities in all five counties requested updated studies due to hydraulic changes throughout the watershed. There are also frequent flooding events along some of the major tributaries in the watershed such as the Genesee River, Irondequoit Creek, Tonawanda Creek, Honeoye Creek, Oatka Creek, and Black Creek. These stream reaches would benefit from updated mapping and



the development of revised Base Flood Elevations (BFEs). The new detailed studies along key stream segments, combined with selected limited detailed studies and updated approximate studies in a new digital format, would be sufficient to assist with enforcement and ensure safe development. The resulting scope of work addresses 23 stream study requests for a total of 176 miles of new detailed study of which 143.99 miles are high priority, 21.41 miles are medium priority, and 10.6 miles are lower priority. A total of 6.69 miles are requested for limited detailed study. And there are many approximate study requests for a total of 200.84 miles. More specific information on stream study requests and other community needs collected through the Discovery process can be found in Table 27: *Summary of Community Floodplain Mapping Needs* of this report. A copy of the recommended scope of work can be found in Appendix O: *Irondequoit-Ninemile Watershed Recommended Scope of Work*.

## Introduction

FEMA is currently implementing the Risk MAP program, across the nation. As part of the Risk MAP process, FEMA, in partnership with NYSDEC, carried out the Discovery phase in the Lake Ontario watersheds, including the Lower Genesee Watershed, as described in Section II: *Lower Genesee Watershed Overview* of this report. The Discovery phase of Risk MAP gathers local information and readily available data to assess the need for new or updated Risk MAP products within the watershed. The effort includes coordination with multiple stakeholders throughout the watershed to gather flood risk information, including mapping needs, and assists communities by both identifying areas of risk and promoting sustainable development methods.

The Lake Ontario Discovery Reports, including this report on the Lower Genesee Watershed, provide users with an in-depth understanding of historical flood risk, existing riverine and coastal data, and current flood mitigation activities within the Lake Ontario basin. The report also summarizes FEMA's ongoing GLCFS. The GLCFS is a comprehensive study of coastal flood hazards for all U.S. shoreline within the Great Lakes Basin, including Lake Ontario. FEMA is conducting the study in cooperation with the U.S. Army Corps of Engineers (USACE), the Association of State Floodplain Managers (ASFPM), and other partners. One benefit of the GLCFS project is that it provides a wide range of data to communities along the Great Lakes, which can be used to promote long-term reduction in flood risk and enhance public safety and community sustainability.

The Discovery process for the Lake Ontario watersheds involved extensive basin-wide data collection and outreach efforts with stakeholders in the project area. The stakeholder group included representatives from FEMA, other Federal agencies, state agencies, county and local governments, as well as watershed-based groups. A full list of stakeholders invited to participate in the Discovery process is available in Appendix A: *Pre-Discovery Mailing List and Invitation Letter*. Discovery stakeholder coordination in this watershed was achieved by several methods, including individual phone calls with local stakeholders, as well as pre-Discovery webinars. The pre-Discovery webinars held in August and September 2013 provided information about the Discovery process and discussed the flood mapping, mitigation, and planning needs of communities within the Lower Genesee Watershed. A record of meeting participants can be found in Appendix B: *Pre-Discovery Stakeholder Meetings* and a summary of the information collected can be found in Appendix C: *Kickoff Meeting Notes*.

Stakeholders were encouraged to attend the in-person Discovery meetings held over two days during November 2013. The main goals of the Discovery meetings were to review and validate the gathered flood risk data and discuss each community's flooding history, development plans, flood mapping needs, and flood risk concerns. These meetings also provided a forum to discuss the importance of mitigation planning and community outreach. Community mapping needs and other comments were documented and are available for further review in **Error! Reference source not found.:** *Summary of Community Floodplain Mapping Needs*, as well as in Appendix N: *Watershed Summary Memorandums*. A summary of the stream study priorities, both high and moderate priority, provided by the communities participating in the Lower Genesee Watershed Discovery project is shown in **Error! Reference source not found.:** *Summary of Lower Genesee*

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

*Watershed Community Mapping Priorities.* One of the most pressing issues for communities in the Lower Genesee Watershed is the age of the existing FIRMs. While Monroe County has digital mapping, communities in Genesee, Livingston, Ontario, and Wyoming Counties still regulate their floodplains using the old style paper maps that were issued in the late 1970s and early 1980s. Additionally, the Town of Middlebury in Wyoming County has no FIRMs. A significant number of communities in the Lower Genesee watershed are experiencing growth or have had significant changes in the hydrology and/or hydraulics of streams that were studied in the 1970s and 1980s. Updated digital products are needed to effectively manage this growth and other smaller developments in the floodplains. In addition to the study requests listed in the Table 1 below, several communities requested updating mapping in areas outside of the watershed. The requests for other watersheds were noted and were incorporated into the appropriate watershed reports and proposed scopes of work. Stream study requests outside of the Lake Ontario contributing watersheds were entered into FEMA's Coordinated Needs Management Strategy (CNMS).

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Monroe	Town of Irondequoit, City of Rochester	Monroe County would like new detailed studies for the Lake Ontario shoreline focusing mostly on Webster, Irondequoit, and Greece. There has been some development along the shoreline. There is a new marina at the mouth of the Genesee River in between Greece and Irondequoit. There is also development along the bluff in the Town of Webster. This study segment within the Lower Genesee watershed is 0.12 miles, with the majority of the shoreline falling into either the Oak Orchard Twelvemile Creek watershed or the Irondequoit Ninemile watershed. This study was requested by Monroe County.
Monroe	City of Rochester, Town of Henrietta, Town of Wheatland, Town of Chili	<p>The Genesee River should be restudied by detailed methods through Monroe and Livingston Counties. The total mileage requested is 60.93 miles.</p> <p>The Genesee River should be an updated detailed study for its entire distance of 13.44 miles through the City of Rochester due to a floodwall on the west side of the river not mapped as providing protection from the 1-percent-annual-chance flood event. The flood wall has an elevation of 516.7 feet and the BFE at the location is 513 ft. This area was not previously mapped as in the floodplain but is shown as within the floodplain in the latest map revision. This study was requested by the City of Rochester, Monroe County.</p> <p>Genesee River should have an updated detailed study for its entire length of 8.21 miles in the Town of Henrietta, due to many elevation certificates for an old subdivision. There is also a very wide floodway that may be overstated. This study was requested by the Town of Henrietta, Monroe County.</p>

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Livingston	Town of Leicester, Town of York, Town of Avon, Town of Genesee	<p>The Genesee River should be restudied by detailed methods through Monroe and Livingston Counties. The total mileage requested is 60.93 miles.</p> <p>The Genesee River should be restudied by detailed methods for a distance of 31.68 miles due to a salt mine collapse in 1994 in the Towns of Leicester and York in Livingston County. This has impacted the topography of the area and changed the floodplain of the river. This request was made by Livingston County.</p> <p>The Genesee River should be an updated detailed study due to significant erosion along the river banks and changes to the Town boundary. Approximately 7.6 miles of the Genesee River is within the Lower Genesee Watershed. The remaining upstream reach is within the Upper Genesee Watershed and is not included in this recommended scope of work. The Upper reach will be included as a study need in FEMA's Consolidated Needs Management System. This study was requested by the Town of Leicester in Livingston County.</p>
Genesee	Village of Le Roy, Town of Le Roy	Oatka Creek should be updated to a detailed study within the Village of Le Roy for a distance of 3.60 miles. Genesee County requested this stream study.
Wyoming	Town of Middlebury, Village of Wyoming	Oatka Creek needs a new detailed study for its length within the Town of Middlebury for a distance of 8.47 miles. There are currently no maps for the Town of Middlebury. This study was requested by the Town of Middlebury in Wyoming County.
Livingston	Town of Conesus, Town of Groveland, Town of Genesee, Town of Livonia	Conesus Lake should be studied as a detailed lake study for a total distance of 8.13 miles. There is redevelopment along the lake front and it would be beneficial to have updated digital maps with a base flood elevation to enforce building standards. This study was requested by the Town of Genesee, Livingston County.
Ontario	Town of Richmond, Town of Canadice	Honeoye Lake should have updated detailed mapping in Ontario County for a distance of 4.48 miles. Suckers Brook, Canandaigua Lake, Honeoye Lake, Seneca Lake, Muar Lake, Irondequoit Creek, Marsh Creek, Ganargua River, and Fall Brook have all experienced development since the floodplains were last identified. LiDAR was collected in 2006 that may help improve the quality and accuracy of any updated mapping for these lakes and streams. This study was requested by Ontario County.
Livingston	Town of Sparta, Town of Conesus	Conesus Creek should be studied in detailed methods in the Town of Sparta, Livingston County for a distance of 2.03 miles. This request was made by Livingston County.

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Livingston	Town of Lima	Honeoye Creek should be a new limited detailed study for its entire length of 10.55 miles through the Town of Lima. There is a need for flood elevations and updated base map due to level of development within the Town. There are also spring ice jams near the Route 5 & 20 Bridge. This study was requested by the Town of Lima, Livingston County.
Ontario	Town of Richmond	Honeoye Creek should be studied by detailed methods from its confluence with Honeoye Lake to the upstream corporate limits for a distance of 6.68 miles. This request was made by the Town of Richmond, Ontario County.
Monroe	Town of Chili, Town of Riga, Village of Churchville	Black Creek should be studied by detailed methods for its entire distance of 22.14 within Monroe County due to the age of the current study and the frequency of flooding events along the creek. This study was requested by Monroe County.
Genesee	Village of Bergen	The Unnamed Tributary to Black Creek (known locally as Minny Creek) should have a new detailed study for a distance of 1.3 miles. This study was requested due to the minor repeat flooding experienced on Gibson Street in the wetland area. An updated study would also help the Village with grant applications. This study was requested by the Village of Bergen, Genesee County.
Monroe	Town of Gates, Town of Ogden	Little Black Creek should have an updated detailed study due to the number of LOMAs within the creek's floodplain. The entire length of the study, for a distance of 7.83 miles in both the Town of Gates and the Town of Ogden should be updated. This study was requested by the Town of Gates and the Town of Ogden in Monroe County.
Monroe	Town of Henrietta	East Stem Middle Branch Red Creek should be an updated detailed study for its entire length of 3.92 miles in the Town of Henrietta due to LOMAs filed for residential development. This study was requested by the Town of Henrietta, Monroe County.
Livingston	Town of Geneseo	Jaycox Creek should be studied by detailed methods from the Village of Geneseo corporate limits to Lima Road for a distance of 3.17 miles. There is flooding caused by a change in topography and a culvert at Lima Road. Digital maps would be helpful for community officials. This study was requested by the Town of Geneseo, Livingston County.
Monroe	Town of Gates	Buffalo Creek should have an updated detailed study that continues through the culvert under the ramp to I-490. The entire existing study, with a length of 1.89 miles, should be updated. This study was requested by the Town of Gates, Monroe County.

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Monroe	Village of Scottsville	The Mill Race should be restudied for a distance of 0.96 miles in the Village of Scottsville due to changes in the operation and use of the stream reach. The volume of water has been reduced, which should result in a narrower floodplain. This study was requested by the Village of Scottsville in Monroe County.
Monroe	Town of Wheatland	The Spring Creek Race should be an updated detailed study in the Hamlet of Mumford along George Street for a distance of 1.23 miles. The race is no longer in use and the Town of Wheatland is having problems with revising the effective map in this area. This request was made by the Town of Wheatland in Monroe County.
Wyoming	Town of Middlebury, Village of Wyoming	Village Brook needs a new detailed study from its confluence with Oatka Creek in the Village of Wyoming to a point 1.91 miles upstream in the Town of Middlebury due to flooding experienced in 1989 that washed out Wass Road. This study was requested by the Town of Middlebury in Wyoming County.
Livingston	Town of York	Bidwells Creek should be studied by detailed methods from the confluence with Salt Creek to just beyond Main Street for a distance of 2.06 miles. This is a residential area of the Town. There is a wastewater treatment plant off of Restof Road along this stream reach. This study was requested by the Town of York, Livingston County.
Livingston	Town of York	Browns Creek should be studied by detailed methods from Limerick Road to the confluence with the Genesee River for a distance of 5.12 miles. This is a densely developed residential area in the center of the Town in York and the current study is outdated. This study was requested by the Town of York in Livingston County.
Livingston	Town of Springwater	Springwater Creek should be studied by detailed methods for its length of 8.83 miles within the town due a proposed trailer park expansion near the stream. Having a base flood elevation would help with regulating the expansion of the trailer park. This study was requested by the Town of Springwater, Livingston County.
Ontario	Town of Richmond	Hemlock Outlet should be studied by detailed methods from Honeoye Creek to the corporate limits for a distance of 5.02 miles. This study was requested by the Town of Richmond, Ontario County.
Livingston	Town of York	Fowler Creek should be studied by detailed methods for its entire distance of 5.22 miles within the Town of York due to structures in the hamlet of Fowlerville that experience flooding. The current detailed study is outdated. This study was requested by the Town of York in Livingston County.

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Livingston	Town of York	Fowler Creek Tributary should be studied by detailed methods from just south of Anderson Road to the confluence with Fowler Creek for a distance of 0.36 miles. There are a few residential structures and a few large commercial structures near the tributary. This study was requested by the Town of York.
Livingston	Town of Springwater	Hemlock Creek should be studied by detailed methods for its length within the town. There is a trailer park near the stream and base flood elevations would be helpful for enforcement purposes. The exact location of this stream request could not be identified. Further outreach will be needed. This stream study request was submitted by the Town of Springwater in Livingston County.
Geneseo	Town of Le Roy	Mud Creek Tributary should be studied by limited detailed methods from the Village of Le Roy corporate limit to Perry Road in the Town of Le Roy for a distance of 2.54 miles due to proposed development in this area. This re-study request was submitted by Genesee County.
Genesee	Town of Batavia	Spring Creek should be a new limited detailed study for a distance of 2.6 miles within the Town of Batavia. There is currently an approximate study for this stream that is impacting development. This upgraded study request was submitted by the Town of Batavia, Genesee County.
Livingston	Village of Lima, Town of Lima	Spring Brook should be a new limited detailed study for its length of 1.55 miles within the Village of Lima. The Village needs the correct extent of the floodplain and elevations for administration of new development. This study was requested by the Village of Lima, Livingston County.
Livingston	Town of Livonia, Town of Geneseo	<p>The Tributaries to Conesus Creek and the northern part of Conesus Lake should be studied by approximate methods in the Town of Livonia and the Town of Geneseo in Livingston County. This request was made by Livingston County.</p> <p>Tributary 1 to Conesus Creek should be studied from the confluence with Conesus Creek for a total distance of .74 miles.</p> <p>Tributary 2 to Conesus Creek should be studied from the confluence with Conesus Creek for a total distance of 1.22 miles.</p> <p>Tributary 3 to Conesus Creek should be studied from the confluence with Conesus Creek for a total distance of 0.65 miles.</p> <p>Tributary 6 to Conesus Creek should be studied from the confluence with Conesus Creek for a total distance of 1.1 miles.</p>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Livingston (cont'd)	Town of Livonia, Town of Geneseo (cont'd)	Tributary 7 to Conesus Creek should be studied from the confluence with Conesus Creek for a total distance of 0.59 miles.
Ontario	Town of Richmond	<p>Honeoye Creek and the Tributaries to Honeoye Creek should be studied by approximate methods. These requests were made by the Town of Richmond in Ontario County.</p> <p>Tributary HC-1 should be studied from its confluence with Honeoye Creek to a point 0.30 miles upstream.</p> <p>Mill Creek should be studied from its confluence with Honeoye Creek to a point 1.62 miles upstream.</p> <p>Tributary HC-2 should be studied from its confluence with Honeoye Creek to a point 0.29 miles upstream.</p> <p>Tributary HC-3 should be studied from its confluence with Honeoye Creek to a point 0.30 miles upstream.</p> <p>Tributary HC-4 should be studied from its confluence with Honeoye Creek to a point 0.56 miles upstream.</p> <p>Tributary HC-5 should be studied from its confluence with Honeoye Creek to a point 0.40 miles upstream.</p> <p>Tributary HC-6 should be studied from its confluence with Honeoye Creek to a point 1.11 miles upstream.</p> <p>Tributary HC-7 should be studied from its confluence with Honeoye Creek to a point 0.14 miles upstream.</p> <p>Tributary HC-8 should be studied from its confluence with Honeoye Creek to a point 0.45 miles upstream.</p> <p>Tributary HC-9 should be studied from its confluence with Honeoye Creek to a point 0.67 miles upstream.</p> <p>Tributary HC-10 should be studied from its confluence with Honeoye Creek to a point 0.23 miles upstream.</p> <p>Tributary HC-11 should be studied from its confluence with Honeoye Creek to a point 1.11 miles upstream.</p> <p>Tributary HC-12 should be studied from its confluence with Honeoye Creek to a point 0.32 miles upstream.</p> <p>Tributary HC-13 should be studied from its confluence with Honeoye Creek to a point 0.28 miles upstream.</p> <p>Tributary HC-14 should be studied from its confluence with Honeoye Creek to a point 0.14 miles upstream.</p> <p>Tributary HC-15 should be studied from its confluence with Honeoye Creek to a point 0.61 miles upstream.</p> <p>Tributary HC-16 should be studied from its confluence with Honeoye Creek to a point 0.18 miles upstream.</p>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Ontario	Town of Richmond (cont'd)	<p>Tributary HC-17 should be studied from its confluence with Honeoye Creek to a point 0.77 miles upstream.</p> <p>Tributary HC-18 should be studied from its confluence with Honeoye Creek to a point 0.28 miles upstream.</p> <p>Tributary HC-19 should be studied from its confluence with Honeoye Creek to a point 0.58 miles upstream.</p> <p>Tributary HC-20 should be studied from its confluence with Honeoye Creek to a point 0.93 miles upstream.</p>
		<p>All streams within the Town of Richmond in Ontario County need to be restudied by approximate methods due to the age of the current maps and studies. Many changes have been made such as bridge and culvert replacements that have changed the stream hydraulics. This request was made by the Town of Richmond in Ontario County.</p> <p>Tributary HO-5 should be studied from its confluence with Hemlock Outlet to a point 0.19 miles upstream.</p> <p>Tributary HO-4 should be studied from its confluence with Hemlock Outlet to a point 0.61 miles upstream.</p> <p>Tributary HO-3 should be studied from its confluence with Hemlock Outlet to a point 0.22 miles upstream.</p> <p>Tributary HO-2 should be studied from its confluence with Hemlock Outlet to a point 0.10 miles upstream.</p> <p>Tributary HO-1 should be studied from its confluence with Hemlock Outlet to a point 0.14 miles upstream.</p> <p>Tributary HO-1A should be studied from its confluence with Hemlock Outlet to a point 0.33 miles upstream.</p> <p>Honeoye Inlet should be studied from its confluence with Honeoye Lake to the southern corporate limits for a distance of 4.45 miles.</p> <p>Tributary H-1 should be studied from its confluence with Honeoye Lake to a point 0.06 miles upstream.</p> <p>Tributary H-2 should be studied from its confluence with Honeoye Lake to a point 0.16 miles upstream.</p> <p>Tributary H-3 should be studied from its confluence with Honeoye Lake to a point 0.11 miles upstream.</p> <p>Tributary H-4 should be studied from its confluence with Honeoye Lake to a point 0.12 miles upstream.</p> <p>Tributary H-5 should be studied from its confluence with Honeoye Lake to a point 0.17 miles upstream.</p>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Ontario	Town of Richmond (cont'd)	<p>Tributary H-6 should be studied from its confluence with Honeoye Lake to a point 0.29 miles upstream.</p> <p>Tributary H-7 should be studied from its confluence with Honeoye Lake to a point 0.05 miles upstream.</p> <p>Tributary H-8 should be studied from its confluence with Honeoye Lake to a point 0.09 miles upstream.</p> <p>Tributary H-9 should be studied from its confluence with Honeoye Lake to a point 0.06 miles upstream.</p> <p>Tributary H-10 should be studied from its confluence with Honeoye Lake to a point 0.08 miles upstream.</p> <p>Tributary H-11 should be studied from its confluence with Honeoye Lake to a point 0.25 miles upstream.</p> <p>Tributary H-12 should be studied from its confluence with Honeoye Lake to a point 0.22 miles upstream.</p> <p>Tributary H-13 should be studied from its confluence with Honeoye Lake to a point 0.30 miles upstream.</p> <p>Tributary H-14 should be studied from its confluence with Honeoye Lake to a point 0.39 miles upstream.</p>
Genesee	Town of Stafford	Black Creek should be mapped by approximate methods from the Thruway in the Town of Stafford to the Town of Bethany town line for a distance of 3.36 miles. Genesee County requested this study since this reach of the Black Creek is currently not mapped.
Genesee	Town of Byron	The tributaries to Black Creek need to be studied by approximate methods in the Town of Byron. The current studies end at the Town of Elba town line. If all tributaries were studied the total request would be equivalent to 50.56 miles of approximate study as requested by Genesee County.
Genesee	Town of Stafford	White Creek needs to be studied by approximate methods for a distance of 1.76 miles in the Town of Stafford along the East Bethany Le Roy Road. This study was requested by Genesee County.
Genesee	Town of Byron	Spring Creek should be studied by approximate methods for a distance of 5.8 miles within the Town of Byron. The creek is studied by approximate methods in the Town of Elba but the study ends at the western corporate limit of the Town of Byron. The Town would benefit from having the study continued from the western corporate limit to the confluence with Black Creek. This request was made by the Town of Byron, Genesee County.

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Genesee	Town of Byron, Town of Elba	The Unnamed Tributaries to Spring Creek should be study by approximate methods from the western corporate limits of Byron to the confluences with Spring Creek. The total mileage of all tributaries to Spring Creek is 43.44 miles. These tributaries are studied by approximate methods in the Town of Elba and the Town of Byron would like these studied continued from Elba into Byron. This request was made by the Town of Byron, Genesee County.
Livingston	Town of York	<p>Tributaries to the Genesee River should be studied by approximate methods through the Town of York. These stream studies were requested by Livingston County.</p> <p>Salt Creek should be studied using approximate methods from its confluence with the Genesee River to a point upstream for a distance of 4.09 miles.</p> <p>Bairds Creek should be studied using approximate methods from its confluence with the Genesee River to a point upstream for a distance of 2.98 miles.</p> <p>Browns Creek should be studied using approximate methods from its confluence with the Genesee River to a point upstream for a distance of 1.97 miles.</p> <p>The Tributary to Browns Creek should be studied using approximate methods from its confluence with Browns Creek to a point 1.67 miles upstream.</p> <p>Genesee River Tributary 7 should be studied using approximate methods from its confluence with the Genesee River to a point 2.05 miles upstream.</p> <p>Genesee River Tributary 7 – 1 should be studied using approximate methods from its confluence with the Genesee River Tributary 7 to a point 4.20 miles upstream.</p> <p>Genesee River Tributary 7 – 1 - 1 should be studied using approximate methods from its confluence with the Genesee River Tributary 7-1 to a point 1.72 miles upstream.</p> <p>Genesee River Tributary 5 should be studied using approximate methods from its confluence with the Genesee River to a point 2.04 miles upstream.</p> <p>Genesee River Tributary 4 should be studied using approximate methods from its confluence with the Genesee River to a point 1.93 miles upstream.</p>
Livingston	Town of Conesus	South McMillan Creek should be studied by approximate methods from Marshal Road to Route 15 for a distance of 1.75 in the Town of Conesus, Livingston County. This study was requested by Livingston County.

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Livingston	Town of Conesus	Tributary 1 to North McMillan Creek should be studied by approximate methods from Marshal Road to Route 15 for a distance of 1.94 miles in the Town of Conesus. This study was requested by Livingston County.
Livingston	Town of Avon, Town of Geneseo	Conesus Creek should be studied by approximate methods in the Town of Avon for a distance of 7.52 miles. There is residential development near the creek where it is currently not studied. This study was requested by Livingston County.
Livingston	Town of Avon	The unnamed stream in the Town of Avon should be studied by approximate methods from north of Sutton Road to East Avon Road for a distance of 2.25 miles. This study was requested by Livingston County.
Livingston	Town of Avon, Town of Geneseo	<p>The Unnamed Tributaries to Conesus Creek and low lying marsh area in the northeast corner of town should be studied by approximate methods. This land is for sale and it may be developed in the near future. Digital approximate studies would be helpful for enforcement of any proposed development. These studies were requested by the Town of Geneseo, Livingston County.</p> <p>Cottonwood Creek should be studied by approximate methods from its confluence with Conesus Lake for a distance of 1.00 miles.</p> <p>Conesus Lake Tributary 7 should be studied by approximate methods from its confluence with Conesus Lake for a distance of 0.53 miles.</p> <p>Conesus Lake Tributary 6 should be studied by approximate methods from its confluence with Conesus Lake for a distance of 0.82 miles.</p> <p>Long Point Gully should be studied by approximate methods from its confluence with Conesus Lake for a distance of 1.12 miles.</p> <p>Sand Point Gully should be studied by approximate methods from its confluence with Conesus Lake for a distance of 1.41 miles.</p> <p>Conesus Lake Tributary 3 should be studied by approximate methods from its confluence with Conesus Lake for a distance of 1.53 miles.</p> <p>Conesus Lake Tributary 2 should be studied by approximate methods from its confluence with Conesus Lake for a distance of 0.42 miles.</p> <p>Conesus Creek should be restudied by approximate methods in the northeast corner of the Town of Geneseo for a distance of 0.30 miles.</p>

*Discovery Report:*  
*Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 1: Summary of Lower Genesee Watershed Community Mapping Priorities**

County	Communities	Priorities
Livingston	Town of Avon, Town of Geneseo (cont'd)	Conesus Creek Tributary 5 should be restudied by approximate methods in the marshy area by the northeast corner of the Town of Geneseo for a distance of 1.76 miles.
Livingston	Town of Leicester	There should be a new approximate study of Beards Creek from just south of County Route 39/State Route 29A to the northern corporate limit of the Town for a distance of 5.15 miles. The current study ends before the Town limit. The exact location of the requested stream segment was unclear but NYSDEC assumed this request for an updated study extends upstream from the Village of Leicester corporate limits and heads west. This study was requested by the Town of Leicester, Livingston County.
Livingston	Town of Leicester	Beards Creek should be studied by approximate methods for its length within the Village of Leicester corporate limits. The Village would like digital mapping products. This study request was included in the 5.15 mile study request from the Town of Leicester. This study was requested by the Village of Leicester, Livingston County.
Livingston	Town of Springwater	Limekiln Creek should be studied by approximate methods for a distance of 6.3 miles within the Town of Springwater. There is little to no development in this area due to agriculture and wetlands along the stream, but an updated digital map would be helpful for community officials. This study was requested by the Town of Springwater, Livingston County.
Wyoming	Town of Wyoming, Town of Warsaw	Oakta Creek, which is the channel running along the railroads between the Towns of Wyoming and Warsaw floods repeatedly and impacts agricultural areas. This segment should be studied using approximate methods for a distance of 7.09 miles. This study was requested by Wyoming County.
Livingston	Village of Geneseo	Jaycox Creek should be re-delineated as a detailed study for its entire distance of 2.86 miles within the Village of Geneseo due to limited detail in the current base map. Having a digital product would be much more useful for planning and enforcement of development. This study request was submitted by the Village of Geneseo, Livingston County.
Wyoming	Town of Middlebury	Town of Middlebury needs floodplain maps, since there are currently no FEMA FIRMs for the Town. This request for mapping was submitted by the Town of Middlebury in Wyoming County.
Livingston	Town of Geneseo	The Town of Geneseo would like digital mapping. Digital approximate studies would be helpful for enforcement of any proposed development. This request was submitted by the Town of Geneseo, Livingston County.

To ensure that any Risk MAP project moving forward takes into account existing data, as well as community mapping needs, the Discovery process also requests stakeholders provide detailed information that may be useful to the mapping process. Questions about existing data sources were discussed during both the pre-Discovery webinars and in-person meetings to determine what information is available and who developed or owns that information. The detailed information about existing data is helpful in determining a proposed scope of work for the project area, especially where there is existing topographic or hydraulic information available locally. The savings to the project, due to the availability of existing data, may allow for additional stream studies to be included. A summary of existing data that potentially could be used as part of a Risk MAP project is included in **Error! Reference source not found.: Summary of Potential Data Sources**. In addition to the sources listed below, the New York State Standard Multi-Hazard Mitigation Plan provides valuable information at a statewide level in support of risk identification and mitigation planning.

**Table 2: Summary of Potential Data Sources**

County	Community	Potential Data	Source
Genesee	Genesee County	Political Boundaries, Transportation Layers, Parcel and Zoning Boundaries, Essential/Critical Facilities, Flood Gage Data, Flood Control Structures, Location of Dams	Genesee County Planning Department
		Flood Gage Data	USACE
	Batavia, City of	Flood Control Structures (Big Ditch)	City of Batavia
	Batavia, Town of	2010 USGS LiDAR	Town of Batavia
	Bergen, Village of	Rain Gage Data, Piped Stream Data	Village of Bergen
	Bethany, Town of	Parcel and Zoning Boundaries,	Town of Bethany
		Historical Flood Inundation Areas	Genesee County Soil and Water
Livingston	Livingston County	Political Boundaries, Transportation Layers, Parcel and Zoning Boundaries, Land Use and Soil data, Bathymetry for Conesus Lake, 2010 LiDAR	Livingston County Planning Department
		Essential/Critical Facilities, Historical Flood Inundation Areas, High Water Marks	Livingston County Emergency Management
	Geneseo, Town of	Political Boundaries, Transportation Layers, Parcel and Zoning Boundaries, Land Use and Soil data	Town of Geneseo
Monroe	Monroe County	Political Boundaries, Transportation Layers, Parcel and Zoning Data, Land Use and Soil Data, Essential/ Critical Facility Data, NOAA Coastal Bathymetry from 2011 LiDAR, Wave Gage Data, Shoreline Change Photos, 2006 County LiDAR, Piped Stream Data	Monroe County GIS Department
	Churchville, Village of	Political Boundaries, Transportation Layers, Parcel and Zoning Data, Building Footprints, Essential/ Critical Facility Data, Flood Control Structures, Location of Dams	Village of Churchville
	Gates, Town of	Piped Stream Data	Town of Gates
	Henrietta, Town of	Political Boundaries, Transportation Layers, Land Use and Soil Data, Parcel and Zoning Data,	Town of Henrietta

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 2: Summary of Potential Data Sources**

County	Community	Potential Data	Source
Monroe (cont'd)	Honeoye Falls, Village of	Land Use and Soil Data, Parcel and Zoning Data, Historical Flood Inundation Areas	Village of Honeoye Falls
	Irondequoit, Town of	Transportation Layers	Town of Irondequoit
	Mendon, Town of	Political Boundaries, Transportation Layers, Land Use and Soil Data, Parcel and Zoning Data, Building Footprints, Historical Flood Inundation Areas	Town of Mendon
	Ogden, Town of	Political Boundaries, Transportation, Land Use and Soil Data, Parcel and Zoning Data, Building Footprints, Essential/Critical Facilities Data	Town of Ogden
	Riga, Town of	Transportation Layers, Land Use and Soil Data, Parcel and Zoning Data, Building Footprints	Town of Riga
	Rochester, City of	Political Boundaries, Transportation Layers, Parcel and Zoning Data, Land Use Data, Building Footprints, Essential/ Critical Facility Data, Coastal Structures	City of Rochester
		Bathymetry for Harbor, Historical Shoreline Change data	USACE
	Rush, Town of	Location of Dams (Mill Dam)	Town of Rush
	Sweden, Town of	Political Boundaries, Transportation, Parcel and Zoning Data, Building Footprint data, Flood Control Structures (Erie Canal)	Town of Sweden
		Soil Data	NRCS
Ontario	Ontario County	Political Boundaries, Transportation Layers, Land Use and Soil Data, Parcel and Zoning data, Building Footprint Data (2009), Historical Flood Inundation Data, LiDAR	Ontario County Information Services
		Essential/Critical Facilities	Ontario County Emergency Management
	Naples, Town of	Political Boundaries, Transportation Layers, Parcel and Zoning data, Essential/Critical Facilities, Historical Flood Inundation Data	Town of Naples
	Richmond, Town of	Political Boundaries, Transportation Layers, Piped Stream Data	Town of Richmond
		Land Use and Soil Data	Ontario County Soil and Water Conservation District
		Zoning data	Town of Richmond Zoning Department
		Rain Gage Data	Honeoye Lake Sewer Department

**Table 2: Summary of Potential Data Sources**

County	Community	Potential Data	Source
	South Bristol, Town of	Political Boundaries, Parcel and Zoning data, Dams	Town of South Bristol Building/Zoning Office
Wyoming	Middlebury, Town of	Political Boundaries, Transportation Layers, Land Use and Soil Data, Parcel and Zoning data	Town of Middlebury Town Supervisor
	Warsaw, Town of	Political Boundaries, Land Use and Soil Data, Parcel and Zoning data, Historical Flood Inundation Data	Town of Warsaw

Since mitigation is a critical process for reducing loss of life and property due to natural hazards, it is the third major component to the Discovery Project. As part of the Discovery process, the State's Standard Multi-Hazard Mitigation Plan and local HMPs were reviewed to better understand existing flood risk within the Lower Genesee Watershed communities. These plans contain risk mitigation strategies and actions already developed as part of local planning processes. By obtaining a better understanding of existing local risk and mitigation actions during this Discovery phase, FEMA is able to work with communities to identify new mitigation actions and strengthen existing actions. In addition, FEMA continues to identify communities that can benefit from mitigation assistance, including training needs. During the Discovery process, many stakeholders noted the need for assistance and requested additional training related to floodplain management and hazard mitigation. **Error! Reference source not found.:** *Community Training Requests* summarizes the training needs as noted by communities during the in-person Discovery meetings.

**Table 3: Community Training Requests**

County	Community	Training Needs
Genesee	Genesee County	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	Batavia, City of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance Other: Participating in the CRS
	Bergen, Village of	Floodplain Management Hazard Mitigation Funding for Hazard Mitigation Projects
	Livingston County	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	Geneseo, Town of	Hazard Mitigation Building and Enforcement Guidance Other: Code Officer Training



**Table 3: Community Training Requests**

County	Community	Training Needs
Livingston	Geneseo, Village of	Hazard Mitigation Building and Enforcement Guidance Other: Code Officer Training
	Lima, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	Lima, Village of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	Springwater, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
Livingston (cont'd)		
Monroe	Monroe County	Other: SLOSH or other wave modeling software
	Chili, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	Churchville, Village of	Hazard Mitigation Other: GIS training
	Gates, Town of	Hazard Mitigation
	Henrietta, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	Honeoye Falls, Village of	Floodplain Management Building and Enforcement Guidance
	Riga, Town of	Hazard Mitigation Other: GIS training
	Rush, Town of	Hazard Mitigation
	Scottsville, Village of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	Wheatland, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
Ontario	Richmond, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
	South Bristol, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance
Wyoming	Middlebury, Town of	Floodplain Management Hazard Mitigation Building and Enforcement Guidance

Overall, the Lower Genesee Watershed Discovery process was successful in gathering and documenting information about flood risk, flood hazards, mitigation plans, mitigation activities, flooding history, development plans, and floodplain management activities to help FEMA and the communities identify areas that may be funded for further flood risk identification and assessment. Using the information collected during the Risk MAP Discovery process, a proposed scope of work was developed by NYSDEC. Community officials in Geneseo, Livingston,

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

Ontario, and Wyoming Counties find the existing maps very difficult to work with and are requesting digital updates. A wholesale restudy of each county may not be warranted, but there are several key stream segments which are identified for new detailed studies. The new detailed studies combined with updated approximate studies in a new digital format would assist both the communities and the county in enforcing floodplain regulations and managing development. More detailed information on the proposed scope of work can be found in *Appendix O: Lower Genesee Watershed Recommended Scope of Work*.

## I. Discovery Overview

FEMA's Risk MAP program helps communities identify, assess, and reduce their flood risk. Through Risk MAP, FEMA provides information to enhance local HMPs, improve community outreach, and increase local resilience to floods.

The Lake Ontario Watershed Discovery project is the beginning of an interactive process that will result in a watershed-wide assessment of existing flood hazard mapping needs, existing information useful in updating FISs, and ultimately recommendations for the development of updated Risk MAP and FIS products, such as updated 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 are 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.

Throughout the Risk MAP process, FEMA engages and partners with States, local communities, and stakeholders to communicate risk. One of the goals of Risk MAP is to build awareness and understanding of risk to empower communities to take action to reduce that risk.

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 determine which areas of the watershed require revised mapping, risk assessment, or mitigation planning assistance through a Risk MAP project; and
- Develop a Discovery Map and Report that summarize and display the Discovery findings

## Great Lakes Coastal Flood Study

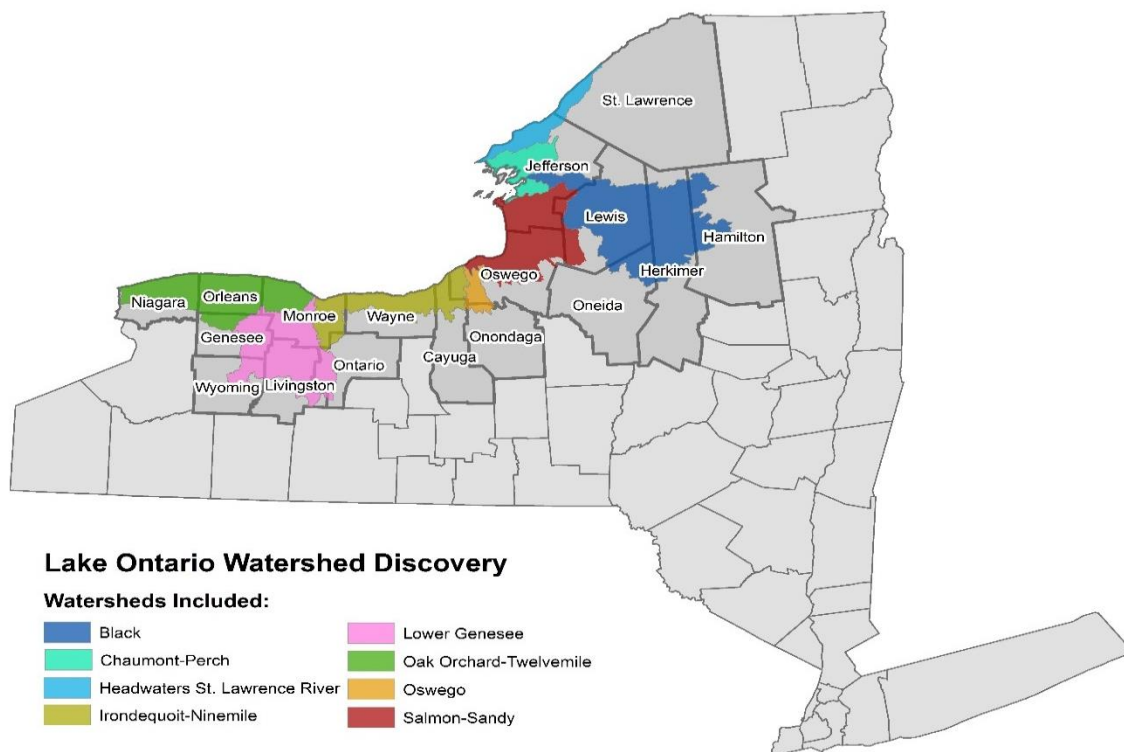
The GLCFS includes a system-wide solution that provides a comprehensive analysis of past storm events that have occurred within Lake Ontario. The program is funded through the FEMA Risk MAP program. FEMA, ASFPM, State partners, and FEMA contractors will collaborate in updating the coastal methodology and flood maps as needed. FEMA manages the NFIP, which is the cornerstone of the national strategy for preparing communities for flood-related disasters.

As part of the Coastal Studies, VE zones designate areas that are at higher risk from high velocity wave action and/or wave runup/overtopping. In such areas significant damage to structures along the coastline can occur. These zones have been mapped nationwide in coastal regions bordering the Atlantic Ocean, Pacific Ocean and Gulf of Mexico, however very few communities along the Great Lakes shorelines have VE Zones presently identified. Because very few VE Zone have been identified and mapped in the past and because the types of major storm events that impact the Great Lakes region are different when compared to the storms on the open ocean of the Atlantic Ocean, Pacific Ocean, or Gulf of Mexico, an independent body was convened to evaluate whether VE Zones are appropriate in the Great Lakes. This study was completed in early 2015. The study concluded that VE Zones are appropriate along the Great Lakes shorelines. The area of moderate wave action, referred to as the Limit of Moderate Wave Action (LiMWA), will be depicted on the FIRMs. The LiMWA is a non-regulatory product for the NFIP.

FEMA initiated a coastal analysis restudy for Lake Ontario as part of a system-wide Great Lakes study. The Great Lakes is a hydraulic system best studied as an integrated system to ensure that interactions among the various lakes are viewed as a whole. The results of the restudy, along with the needs of the communities as identified during the Discovery process, will determine whether updated FIRMs are produced. The new coastal flood study will update the 1-percent-annual-chance stillwater elevations developed from the comprehensive storm surge study and overland wave analysis of Lake Ontario.

An updated coastal flood study is needed to obtain a better estimate of Lake Ontario's unique coastal flood hazards. The current, effective FIRMs for the surrounding communities are outdated in terms of age and the methodologies used in the coastal analysis to produce them. There have been major changes in NFIP policies and updates to the guidelines and specifications used to complete coastal flood studies since the effective date of many of the area's Flood Insurance Studies (FISs). Therefore, an update that will reflect a more detailed and complete hazard determination is needed.

Figure 1 provides an overview of the watersheds that have been included within the Lake Ontario Discovery project. Eight individual watershed Discovery reports have been concurrently developed and include 17 counties and 246 individual communities. The Lower Genesee Watershed is shown in pink in Figure 1 and includes portions of Genesee, Livingston, Monroe, Ontario, Orleans, Steuben, and Wyoming counties. (Orleans and Steuben Counties do not contain flooding sources within the Lower Genesee Watershed.)



**Figure 1: Watersheds Included Within the Lake Ontario Discovery Project**

## Coastal Barrier Resources System

The Coastal Barrier Resources Act (CBRA) of 1982 and (subsequent amendments) established the John H. Chafee Coastal Barrier Resources System (CBRS). The CBRS consists of undeveloped coastal barriers located along the Atlantic Ocean, Gulf of Mexico, and Great Lakes coasts. CBRS areas are generally depositional geologic features that are subject to wave, tidal, and wind energies; protect landward aquatic habitats from direct wave attack; and contain associated aquatic habitats, including adjacent wetlands, marshes, estuaries, inlets, and near-shore waters. The law encourages the conservation of vulnerable, biologically rich coastal barriers by restricting Federal expenditures that encourage development, such as Federal flood insurance. CBRS areas are identified and depicted on a series of official maps entitled “John H. Chafee Coastal Barrier Resources System.” These maps are controlling and form the basis of CBRS boundaries shown on FEMA FIRMs. The CBRS maps are maintained by the Department of the Interior through the U.S. Fish and Wildlife Service. Aside from three minor exceptions, only Congress has the authority to add or delete land from the CBRS and create new units. These exceptions include: (1) voluntary additions to the CBRS by property owners; (2) additions of excess Federal property to the CBRS; and (3) the CBRA 5-year review requirement that solely considers changes that have occurred to System units by natural forces such as erosion and accretion. <http://www.fws.gov/cbra/index.html>

The CBRS contain two types of units, System units (e.g. NY-11) and Otherwise Protected Areas (OPAs). OPAs are denoted with a “P” at the end of the unit number (e.g. NY-11P). An

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

interactive CBRS Mapper is available to the public to help property owners and local, State, and Federal stakeholders to determine sites affected by CBRA at [CBRS Mapper](#).

There are 157 miles of CBRS boundaries around Lake Ontario. There are no CBRS areas in the Lower Genesee Watershed.

## Coastal Zone Protection Structures

The USACE Enterprise Coastal Inventory Database houses information on more than 900 coastal structures as well as associated inlet data across the United States. The coastal structures protect harbors and shore-based infrastructure; provide shoreline stability control; provide flood protection; and protect coastal communities, roadways, and bridges. Coastal structures include seawalls, groins, bulkheads, revetments, dikes, levees, breakwaters, jetties, and piers. Due to the variability of long-term lake water levels from year to year, coastal structures designed and constructed during one particular lake level may not afford the same level of risk protection when lake levels either increase or decrease. Coastal structures should be evaluated for a range of lake water levels. The coastal structure data were provided by USACE, Buffalo District. These data have been added to the Discovery Map.

## Stakeholder Coordination

### Pre-Discovery Meetings (via WebEx)

To begin this effort, [NYSDEC](#)'s Floodplain Management Section along with Risk Assessment, Mapping, and Planning Partners (RAMPP)—a joint venture between Dewberry, AECOM (formerly URS), and ESP—compiled an extensive list of contact information for community officials within the watershed. In an effort to gather as much feedback from as many public officials and jurisdictions as possible, local officials from individual communities and the counties were invited to the proposed meetings. A list of the community leaders invited to the WebEx sessions is available in Appendix A: *Pre-Discovery Mailing List*. A sample invitation letter is also shown.

NYSDEC conducted pre-Discovery WebEx sessions with public officials from Genesee, Livingston, Monroe, Ontario, and Wyoming counties in the summer of 2013 for the purpose of examining the flood mapping, mitigation, planning, and other community needs within the counties comprising the Lower Genesee Watershed. These meetings were designed as focus groups for community officials engaged in the administration, planning, emergency, and public works duties of local jurisdictions. A record of the participants of these meetings can be found in Appendix B: *Pre-Discovery Stakeholder Meetings*. While not expressly excluded, the public does not generally attend these meetings.

The meeting notes are shown in Appendix C: *Kickoff Meeting Notes*. These notes contain comments from those interviewed by NYSDEC and other staff to determine each attending community's flood mapping priorities. The results of these meetings were summarized and forwarded to the FEMA Region II office.

## Other Stakeholders

In addition to municipal officials, planning and emergency agencies, and local residents, there are other stakeholders with an interest in floodplain mapping and management. Major landowners, large employers, academic institutions, and environmental and sporting organizations all have a role to play, and often have valuable information to provide, when developing both pre-mapping data and final mapping products.

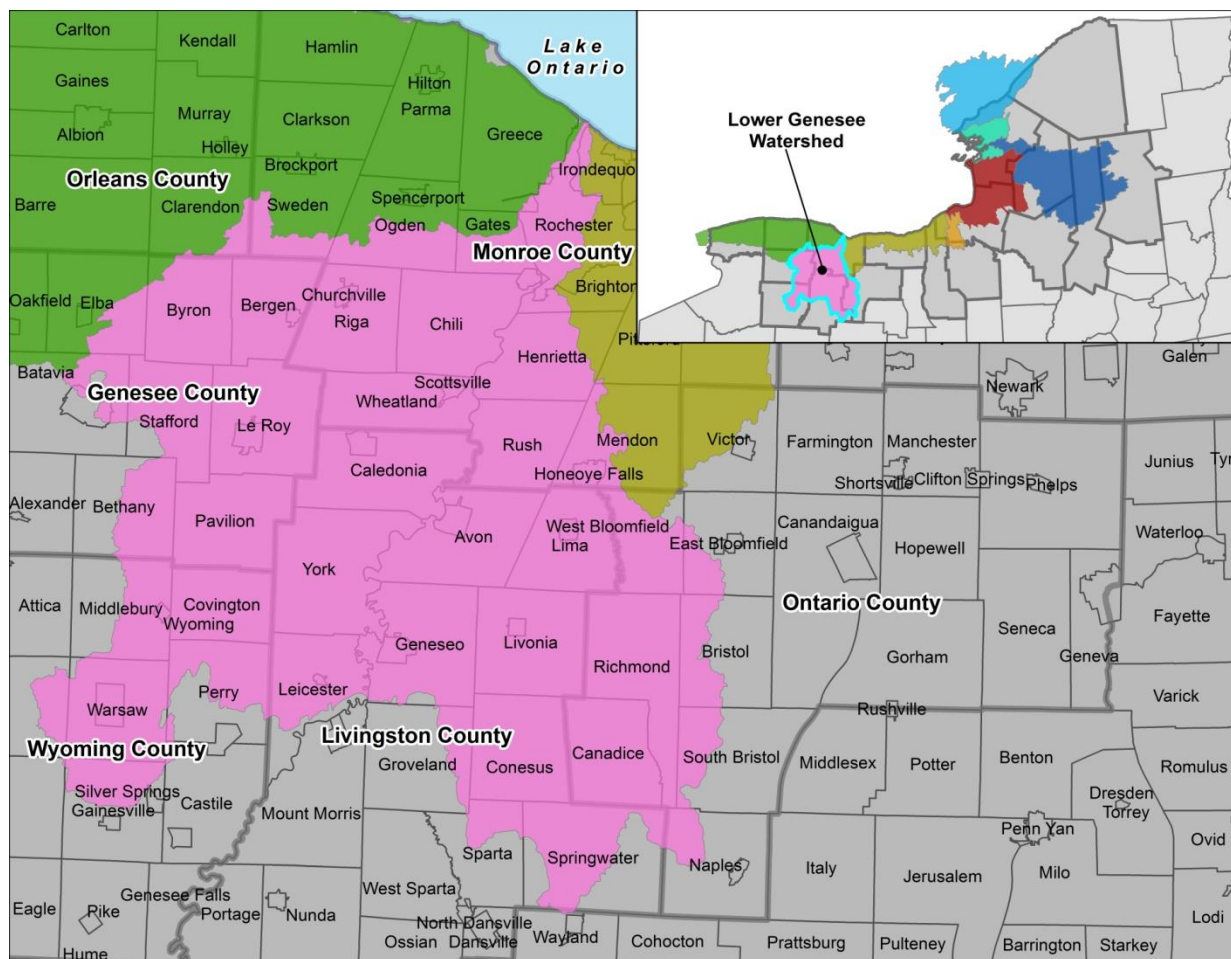
Who should be included in any compilation of watershed stakeholders is both a debatable and incomplete list. However, an attempt to identify several relevant stakeholders in the watershed is shown in Appendix D: *Other Stakeholders in the Lower Genesee Watershed*. This appendix will be added to and amended as needed, if or when further outreach is conducted with the communities during this project and any subsequent mapping efforts within the watershed.

## II. Lower Genesee Watershed Overview

### Geography

The Lower Genesee Watershed (Figure 2) is located in the western portion of New York State almost directly south of the center of Lake Ontario. Portions of Genesee, Livingston, Monroe, Ontario, Orleans, Steuben, and Wyoming Counties lie within the watershed. The watershed occupies 683,237 acres and ranges in elevation from 239 to 2,283 feet above sea level. The higher elevations tend to be in the southern branches of the watershed. ([NRCS](#))





**Figure 2: Lower Genesee Watershed Communities**

## Property Ownership

Land ownership in the watershed is diverse. Urban areas make up 10.4% of the watershed and include Avon, Batavia, Caledonia, Churchville, Geneseo, Le Roy, Lima, Livonia, Mt. Morris, Rochester, Scottsville, and Warsaw. Agriculture is spread out fairly evenly across of the watershed. There are approximately 1,219 farms in the watershed and most of the operations are small to medium sized. The majority of the farm operations are raising some sort of livestock with horses, beef cows, and milk cows rounding out the top three. Dry hay or haylage is the predominant crop followed by corn for grain then corn for silage. ([NRCS](#))

The Lower Genesee Watershed lies within portions of Genesee, Livingston, Monroe, Ontario, Orleans, Steuben, and Wyoming Counties, New York. Monroe County is in the northern tier of western New York State, northeast of Buffalo and northwest of Syracuse. The northern county line is also the State line and the border of the United States, marked by Lake Ontario. Monroe County is north of the Finger Lakes. Genesee County is in western New York State, south of Lake Ontario, east of Buffalo, and west of Rochester. It borders Orleans County to the north, Monroe and Livingston County to the east, Wyoming County to the south, and Erie County to the west. Livingston County is in western New York State, south of Lake Ontario, east of Buffalo,

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

and west of Rochester. Orleans County is located in western New York State. The county borders Lake Ontario, lies east of Buffalo, and west of Rochester. Ontario County is in western New York State, east of Buffalo, southeast of Rochester, and northwest of Ithaca. The county is within the Finger Lakes Region of the State. Steuben County lies south of Ontario and Livingston Counties. Wyoming County is in the northern tier of western New York State, northeast of Buffalo and northwest of Syracuse.

The majority of employment is within government, recreation (seasonal), health care, education, manufacturing, and food processing. Major employers include Genesee County Government, United Memorial Medical Center, Genesee Valley Educational Partnership, Genesee Community College, U.S. Veterans Hospital, Graham Corporation, O-AT-KA Milk Products, Bounduelle, Chapin Manufacturing, the Genesee County Chapter of NYSARC, and U.S. Immigration and Naturalization Services.

According to the U.S. Census Bureau, Genesee County has a total area of 495 square miles, (1,282 km<sup>2</sup>), of which 201 square miles (521 km<sup>2</sup>) (41 percent) is within the Lower Genesee Watershed. Livingston County has a total area of 632 square miles, (1,637 km<sup>2</sup>), of which 359 square miles (930 km<sup>2</sup>) (57%) is within the Lower Genesee Watershed. Monroe County has a total area of 657 square miles, (1,702 km<sup>2</sup>), of which 246 square miles (637 km<sup>2</sup>) (37%) is within the Lower Genesee Watershed. Ontario County has a total area of 644 square miles, (1,668 km<sup>2</sup>), of which 135 square miles (350 km<sup>2</sup>) (21%) is within the Lower Genesee Watershed. Orleans County has a total area of 391 square miles (1,013 km<sup>2</sup>), of which 4 square miles (10 km<sup>2</sup>) (1%) is within the Lower Genesee Watershed. Wyoming County has a total area of 593 square miles (1,536 km<sup>2</sup>), of which 121 square miles (313 km<sup>2</sup>) (20%) is within the Lower Genesee Watershed.

According to the USDA 2007 Census of Agriculture, there are approximately 1,219 total farms throughout the Lower Genesee Watershed, consisting of 334,625 acres of farmland. Of the 1,219 farms, 224 of the farms are located within Genesee County, consisting of 116 square miles (300 km<sup>2</sup>). There are 444 farms located within Livingston County, consisting of 195 square miles (505 km<sup>2</sup>), 216 farms located within Monroe County, consisting of 77 square miles (199 km<sup>2</sup>), 175 farms located within Ontario County, consisting of 63 square miles (163 km<sup>2</sup>), 6 farms located within Orleans County, consisting of 2 square miles (5 km<sup>2</sup>), and 154 farms located within Wyoming County, consisting of 69 square miles (179 km<sup>2</sup>) of farmland within the Lower Genesee Watershed.

More information on property ownership can be found on each county's Real Property webpage as noted in Table 4.



**Table 4: Links to County Real Property Webpages**

County	Hyperlink to Real Property Webpage
Genesee	<a href="http://www.geneseecounty.oarsystem.com/">http://www.geneseecounty.oarsystem.com/</a>
Livingston	<a href="http://www.co.livingston.state.ny.us/real_property.htm">http://www.co.livingston.state.ny.us/real_property.htm</a>
Monroe	<a href="http://www2.monroecounty.gov/property-index.php">http://www2.monroecounty.gov/property-index.php</a>
Ontario	<a href="http://www.co.ontario.ny.us/index.aspx?nid=96">http://www.co.ontario.ny.us/index.aspx?nid=96</a>
Orleans	<a href="http://www.orleansny.com/Departments/TaxandFinance/RealProperty.aspx">http://www.orleansny.com/Departments/TaxandFinance/RealProperty.aspx</a>
Wyoming	<a href="http://www.wyomingco.net/real/main.html">http://www.wyomingco.net/real/main.html</a>

## Demographics

In New York, the Lower Genesee Watershed covers parts of over 50 cities, towns, and villages. Genesee County is part of the Batavia Metropolitan Statistical Area. Orleans, Monroe, Ontario, and Livingston Counties are part of the Rochester Metropolitan Statistical Area. The distribution of population by county in the watershed can be seen in Table 5: *Approximate 2010 Population in the Lower Genesee Watershed*.

During the in-person meetings several communities noted current and future development pressures near flooding sources, which have been included in **Error! Reference source not found.:** *Summary of Community Floodplain Mapping Needs*.

**Table 5: Approximate 2010 Population in the Lower Genesee Watershed**

County	Total County Population (2010 data)	Percent of County Population in Lower Genesee Watershed	2010 Estimated Population in the Lower Genesee Watershed (Based on % in Watershed * Total Population)	Square Miles in Lower Genesee Watershed
Genesee	60,079	40.89	24,567	201.36
Livingston	65,393	66.62	43,562	359.27
Monroe	744,344	35.50	264,245	246.14
Ontario	107,931	9.54	10,294	135.50
Orleans	42,883	0.94	405	4.08
Wyoming	42,155	25.87	10,907	121.07
Total	1,062,785	33.30	353,980	1,067.42

## 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.

Based on the National Land Cover Database (NLCD) land cover classes, grasslands account for the majority (29.0%) of the Lower Genesee Watershed, followed by cultivated crops (26.5%),

forest (21.7), development (11.2%), wetland (6.2%), shrub (3.6 %), open water (1.5%) and barren land (0.3%). ([NRCS](#))

While many of the communities in the watershed do not have land-use management plans, links to those counties that have developed plans have been compiled in Table 6: *Links to County Land Use*.

**Table 6: Links to County Land Use**

County	Hyperlink to Real Property Webpage
Genesee	<a href="http://www.co.genesee.ny.us/departments/planning/">http://www.co.genesee.ny.us/departments/planning/</a>
Livingston	<a href="http://www.co.livingston.state.ny.us/planning.htm">http://www.co.livingston.state.ny.us/planning.htm</a>
Monroe	<a href="http://www2.monroecounty.gov/planning-planning.php">http://www2.monroecounty.gov/planning-planning.php</a>
Ontario	<a href="http://www.co.ontario.ny.us/index.aspx?NID=516">http://www.co.ontario.ny.us/index.aspx?NID=516</a>
Orleans	<a href="http://www.orleansny.com/Departments/ResidentServices/Planning.aspx">http://www.orleansny.com/Departments/ResidentServices/Planning.aspx</a>
Wyoming	<a href="http://www.wyomingco.net/econ/main.html">http://www.wyomingco.net/econ/main.html</a>

Table 7: *U.S. Census 2010 and USDA Census of Agriculture 2007* summarizes the total population and land area from the 2010 U.S. Census and the number of farms and acres of farmland from the USDA 2007 Census of Agriculture.

**Table 7: U.S. Census 2010 and USDA Census of Agriculture 2007**

County	Land Area (Square Miles)	Farm Land (Acres)	Farm Land (Acres) Within Watershed	Total Farms Within Watershed
Genesee	495	183,539	74,517	224
Livingston	632	222,415	124,775	444
Monroe	657	133,041	49,092	216
Ontario	644	198,937	40,583	175
Orleans	391	139,764	1,398	6
Wyoming	593	218,028	44,260	154

As was noted during the in-person meetings, growth in the watershed remains subdued for most communities. Construction of new homes and commercial properties does continue at a slow pace. While larger developments may have a greater impact on the watershed, they are often the most heavily scrutinized before and during construction, and, therefore, are usually the most likely to be compliant with NFIP regulations. In the Lower Genesee Watershed, two other types of construction may cause greater long-term impact on the watershed's vulnerability to flooding: the incremental conversion of summer cottages to year-round residences and piecemeal, limited-scale housing developments. Community specific information provided during these meetings has been summarized in **Error! Reference source not found.:** *Summary of Community Floodplain Mapping Needs*.

It is important when issuing building permits for upgrades to these (and all) homes located in the Special Flood Hazard Area (SFHA) that local building and code officers know the NFIP's requirements concerning the "substantial improvement" clause. "Substantial improvement" means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction." Comprehensive guidance on building or rebuilding in an SFHA can be found in

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

FEMA’s *Substantial Improvement/Substantial Damage Desk Reference*. A summary of this publication and a link to where the publication can be found online is provided as Attachment 1 of this report.

The prevalence of smaller developments (often as small as two building sites) planned across the watershed may be a challenge to effective floodplain management, as these micro-developments can easily slip through regulatory cracks. Local officials need to be aware that minimum NYS building codes and NFIP/local building standards must be met for construction in the SFHA. The NFIP also has additional regulations for projects within the approximate Zone A that involve 50 lots or five acres, whichever is smaller (44 Code of Federal Regulations [CFR] 60.3(b)(3)). Information on the NFIP’s building requirements in the SFHA can be found in NYSDEC’s report *Floodplain Construction Requirements in New York State*. A copy of this brochure can be found [online](#) or as Attachment 2 in the digital version of this report.

### III. Summary of Data Analysis

A large collection of tabular and spatial data was compiled for all communities from Federal, State, and local sources. Community specific information was collected through interactive mapping webinars with stakeholders at the in-person Discovery meetings.

Table 8: *Data Collected for the Lower Genesee Watershed* lists the deliverable or product in which the data were included and the respective sources. In addition, the discussion in this section is divided into two parts covering the data that can be used for Risk MAP products and the information that helped the study team to better understand the study area.

**Table 8: Data Collected for the Lower Genesee Watershed**

Data Types	Source
Average Annualized Loss Data	Census 2010 and Hazus-MH
Boundaries: Community	FEMA, NYSDEC
Boundaries: County and State	FEMA, NYSDEC
Boundaries: Watersheds	USGS, NYSDEC
Census Blocks	U.S. Census Bureau
Coastal Erosion Hazard Areas (CEHA)	NYSDEC
CBRS	U.S. Fish and Wildlife Service
Contacts	Local websites, State/FEMA updates, NYSDEC
Community Assistance Visits	Community Information System (CIS)
Community Rating System	FEMA’s “Community Rating System Communities and Their Classes”
Coordinated Needs Management Strategy	FEMA
Critical Facilities Vulnerable to Flooding	Local Mitigation Plans
Dams and/or Levees	USACE National Levee Database (NLD), USACE National Inventory of Dams (NID), FEMA Mid-Term Levee Inventory (MLI), NYSDEC
Declared Disasters	FEMA’s “Disaster Declarations Summary”
Demographics, Industry	U.S. Census Bureau, HMPs
Effective Floodplains: Modernized SFHAs	FEMA’s Mapping Service Center and Mapping Information Platform
Coastal Gage Data	USGS, NOAA CO-OPS
Hazard Mitigation Plans and Status	New York State Department of Homeland Security and Emergency Services (NYS DHSES)

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

Data Types	Source
Structural Improvements	Local stakeholders

## Data That Can Be Used for Flood Risk Products

During the Discovery process, a database of available flood hazard and flood risk assessment data was created. This database is an inventory of available data and helps identify flood hazard data gaps. State, county, and other government Geographic Information System (GIS) websites are a good place to start the data search, but local knowledge of flooding and mitigation projects is critical to help accurately determine flood risks and mapping needs. Therefore, locally and regionally developed data are used where available.

### Average Annualized Loss (AAL) Data

The 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 current Hazus-MH analysis is based on approximate flood boundaries and national datasets.

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.

The countywide results for the Lower Genesee Watershed were obtained from the 2012 report called FEMA Hazus AAL Usability Analysis and are shown in Table 9: *Hazus-MH AAL Data for Lower Genesee Watershed*. AAL data summarized at the census block level are shown on Discovery Maps. AAL data are also available in Appendix K: *FEMA Hazus-MH Average Annualized Loss (AAL)*.

The Lower Genesee Watershed has a total AAL of \$7.3 billion, with \$4.2 billion within Monroe County. AAL estimated damages are spread throughout the watershed with losses concentrated around Black Creek, the Genesee River, Oatka Creek, and Spring Creek. Significant AAL estimates are also shown along the Genesee River in the City of Rochester and within the Towns of Brighton, Henrietta, Wheatland, Caledonia, and Avon.

The City of Rochester in Monroe County has the highest AAL, followed by the Town and Village of Warsaw in Wyoming County; Towns of Henrietta, Irondequoit, Chili, and Gates in Monroe County; and the Town of Geneseo in Livingston County.

Spring Creek in the Town of Byron and Black Creek in the Town of Stafford in Genesee County do not have Special Flood Hazard Areas (SFHAs), but each has several AAL census blocks of damage located within these areas.

No AAL damages have been captured for the Lower Genesee River Watershed in Orleans County or Steuben County.

**Table 9: 2010 Hazus-MH AAL Data for Lower Genesee Watershed**

County	Community	Building Loss (in thousands of dollars)	Contents Loss (in thousands of dollars)	Total Loss (in thousands of dollars)*
Genesee	Batavia, City of	\$0	\$0	\$0
	Batavia, Town of	\$0	\$0	\$0
	Bergen, Town of	\$5,000	\$2,000	\$7,000
	Bergen, Village of			
	Bethany, Town of	\$6,000	\$12,000	\$18,000
	Byron, Town of	\$18,000	\$13,000	\$31,000
	Elba, Town of	\$0	\$0	\$0
	Le Roy, Town of	\$113,000	\$175,000	\$288,000
	Le Roy, Village of			
	Pavilion, Town of	\$8,000	\$8,000	\$17,000
	Stafford, Town of	\$37,000	\$74,000	\$114,000
Livingston	Avon, Town of	\$88,000	\$69,000	\$160,000
	Avon, Village of			
	Caledonia, Town of	\$38,000	\$34,000	\$74,000
	Caledonia, Village of			
	Conesus, Town of	\$1,000	\$3,000	\$4,000
	Geneseo, Town of	\$240,000	\$202,000	\$452,000
	Geneseo, Village of			
	Groveland, Town of	\$0	\$0	\$0
	Leicester, Town of	\$7,000	\$12,000	\$19,000
	Leicester, Village of			
	Lima, Town of	\$44,000	\$52,000	\$100,000
	Lima, Village of			
	Livonia, Town of	\$31,000	\$29,000	\$61,000
	Livonia, Village of			
	Sparta, Town of	\$0	\$0	\$0
	Springwater, Town of	\$0	\$4,000	\$4,000
	York, Town of	\$99,000	\$50,000	\$149,000
	Brighton, Town of	\$47,000	\$114,000	\$187,000
	Chili, Town of	\$199,000	\$248,000	\$458,000
	Churchville, Village of	\$12,000	\$10,000	\$22,000
	Gates, Town of	\$112,000	\$251,000	\$374,000
	Henrietta, Town of	\$235,000	\$479,000	\$750,000
	Honeoye Falls, Village of	\$0	\$0	\$0
	Irondequoit, Town of	\$231,000	\$283,000	\$527,000
	Mendon, Town of	\$13,000	\$9,000	\$22,000
	Ogden, Town of	\$0	\$0	\$0
	Riga, Town of	\$47,000	\$31,000	\$78,000
	Rochester, City of	\$572,000	\$823,000	\$1,432,000
	Rush, Town of	\$0	\$0	\$0

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 9: 2010 Hazus-MH AAL Data for Lower Genesee Watershed**

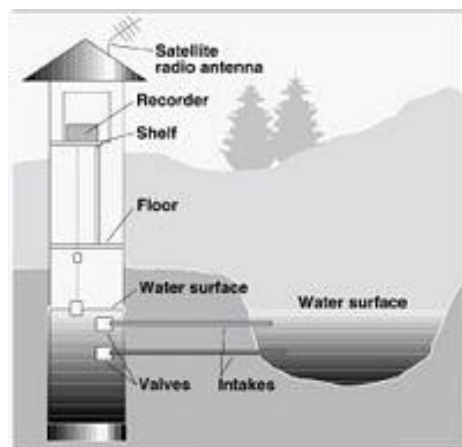
County	Community	Building Loss (in thousands of dollars)	Contents Loss (in thousands of dollars)	Total Loss (in thousands of dollars)*
	Scottsville, Village of	\$39,000	\$80,000	\$127,000
	Sweden, Town of	\$0	\$0	\$0
	Wheatland, Town of	\$90,000	\$125,000	\$223,000
Ontario	Canadice, Town of	\$0	\$1,000	\$1,000
	Naples, Town of	\$0	\$0	\$0
	Richmond, Town of	\$35,000	\$94,000	\$132,000
	South Bristol, Town of	\$0	\$1,000	\$1,000
	West Bloomfield, Town of	\$29,000	\$28,000	\$59,000
Wyoming	Covington, Town of	\$1,000	\$0	\$1,000
	Gainesville, Town of	\$0	\$0	\$0
	Middlebury, Town of	\$6,000	\$8,000	\$15,000
	Orangeville, Town of	\$0	\$0	\$0
	Perry, Town of	\$0	\$0	\$0
	Warsaw, Town of	\$386,000	\$970,000	\$1,410,000
	Warsaw, Village of			
	Wyoming, Village of	\$6,000	\$7,000	\$13,000
Total		\$2,795,000	\$4,301,000	\$7,330,000

Source: FEMA HAZUS AAL Usability Analysis 2012

Total loss includes business interruption losses where applicable.

## Gage Data

### Stream Gages



**Figure 3: Typical Modern USGS Stream Gage**

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 3: *Typical Modern USGS Stream Gage* illustrates the design of a river gaging station.

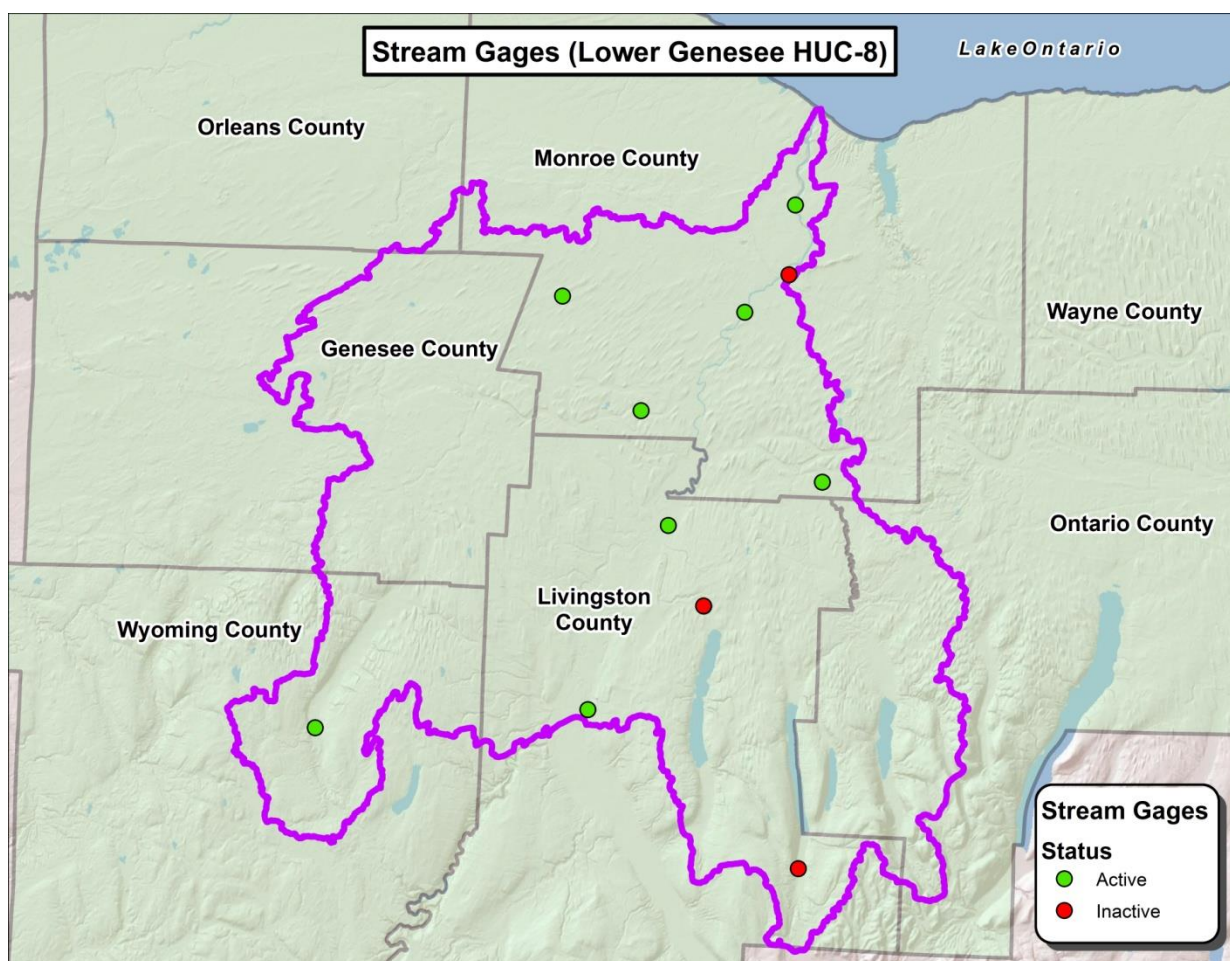
At most USGS stream gages, the stage is measured every 15 minutes and the data are stored in an electronic data recorder. At set intervals, usually between every 1 to 4 hours, the data are transmitted to USGS using satellite, phone, or radio. At the USGS offices, the curves relating stage to stream flow 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 USGS's factsheet on stream gaging at <http://pubs.usgs.gov/fs/2005/3131>.

There are 12 known current and past gages in the watershed and nine are currently active and being monitored by USGS and NYSDEC (Figure 4: *Lower Genesee Watershed Stream Gages*).

Table 10, *Stream Gage Stations*, shows the gage identification number, location, drainage area, status, and county for all USGS gages identified in the Lower Genesee Watershed. Historical stream flow information from the USGS gages listed in Table 10 will be employed for use in hydrological analysis where applicable. Additional information on gages in the watershed may be found by visiting [USGS's website](http://pubs.usgs.gov/fs/2005/3131).



**Figure 4: Lower Genesee Watershed Stream Gages**

**Table 10: Stream Gage Stations**

Gage ID	Gage Location	Drainage Area (sq. miles)	Gage Status	County
04228900	Springwater Creek at Springwater NY	10.1	Inactive	Livingston
04230380	Oatka Creek at Warsaw NY	39.1	Active	Wyoming

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 10: Stream Gage Stations**

Gage ID	Gage Location	Drainage Area (sq. miles)	Gage Status	County
04227500	Genesee River near Mount Morris NY	1,424	Active	Livingston
04227995	Conesus Creek near Lakeville NY	72	Active	Livingston
04228000	Conesus Creek near Lakeville NY	72	Inactive	Livingston
04228500	Genesee River at Avon NY	1,673	Active	Livingston
04229500	Honeoye Creek at Honeoye Falls NY	196	Active	Monroe
04230500	Oatka Creek at Garbutt NY	200	Active	Monroe
04230650	Genesee River at Ballantyne Bridge near Mortimer Avenue	2,210	Active	Monroe
04231000	Black Creek at Churchville NY	130	Active	Monroe
04231500	Genesee River below Erie Canal at Rochester NY	2,457	Inactive	Monroe
04232000	Genesee River at Rochester NY	2,467	Active	Monroe

### **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. Within the Lower Genesee Watershed, one location is currently active. 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 have been updated through a joint collaboration between the National Resources Conservation Service (NRCS) and the Northeast Regional Climate Center (NRCC) and is available at [Extreme Precipitation in New York and New England webpage](#).

### **Water Level Observations Network**

The NOAA National Ocean Service is responsible for recording and disseminating water level data. The National Data Buoy Center (NDBC) is part of the NOAA National Weather Service (NWS) <http://www.ndbc.noaa.gov>. NDBC designs, develops, operates, and maintains a U.S. network of data collecting buoys and coastal stations. It should be noted that no stations within the Great Lakes provide tidal information, as the tidal range is minimal. There are no tidal gages within the Lower Genesee Watershed.

### **Levees**

Three NYSDEC flood-control projects are located within the study area. These include the Batavia facility on Tonawanda Creek in Genesee County; the Lakeville facility on Conesus Lake in Livingston County; and the Warsaw facility on Oatka Creek in Wyoming County.



The last inspection date for all of the facilities was summer 1999. Drawings and operation and maintenance manuals are available through NYSDEC and the USACE Buffalo District.

## Dams

According to the [NYSDEC Dam Safety Section](#)'s dam inventory, the Lower Genesee Watershed contains 140 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. The locations of dams in the watershed are shown in Figure 5: *Dams in Lower Genesee Watershed*.

NYSDEC classifies dams in the State using the following criteria:

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.

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 11: *Dams in the Lower Genesee Watershed* shows the classification of dams located in the Lower Genesee Watershed. According to the NYSDEC Dam Safety Section's dam files, many of the Class B and C dams have reports and studies available. A summary of this information is available in Appendix L: *Dams and Floodplain Structures*. Information includes inspection and certification dates, site plans, analysis (Hydrologic and Hydraulic), As-Built drawings, Emergency Action Plans, inundation mapping, applications and permits for maintenance, and correspondence related to each dam.

**Table 11: Dams in the Lower Genesee Watershed**

County	Low Hazard Class A	Intermediate Hazard Class B	High Hazard Class C	Negligible Class D	Unclassified Class 0	Total
Genesee	15	4	0	10	1	30
Livingston	22	4	1	15	0	42
Monroe	21	0	2	9	1	33
Ontario	16	0	1	3	0	20

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

County	Low Hazard Class A	Intermediate Hazard Class B	High Hazard Class C	Negligible Class D	Unclassified Class 0	Total
Wyoming	8	0	0	2	5	15
Total	82	8	4	39	7	140

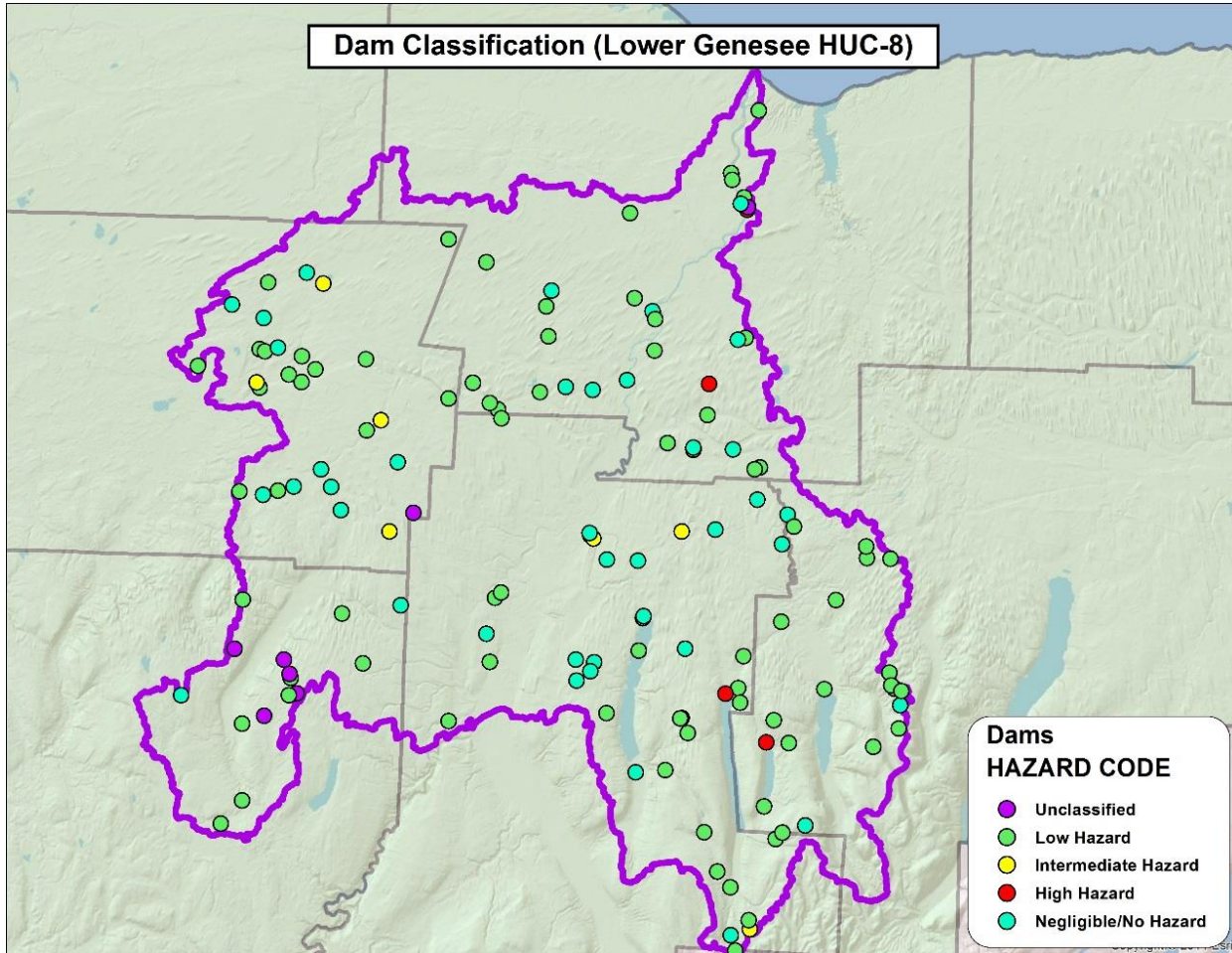


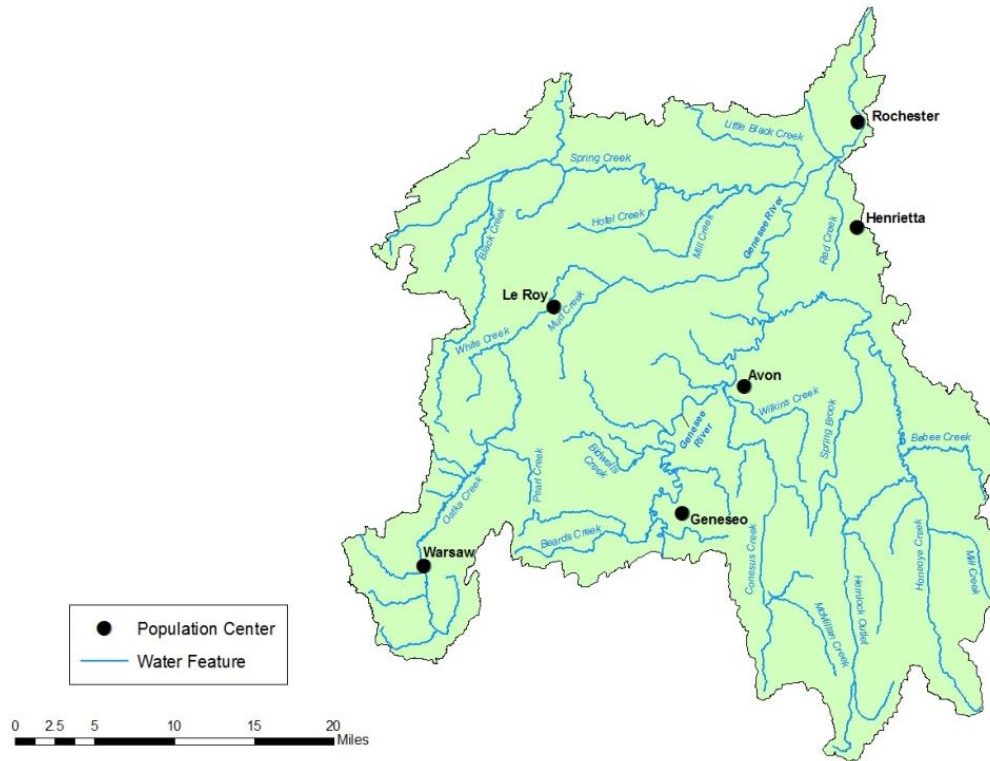
Figure 5: Dams in the Lower Genesee Watershed

## Watershed Boundaries

The Lower Genesee Watershed is a HUC-8 watershed. Figure 6 shows the boundaries of the Lower Genesee Watershed. Each watershed in decreasing area (increasing number of digits in the HUC) is made up of several contiguous watersheds of smaller hierarchy. The first two digits of the HUC 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. 0413, Southwestern Lake Ontario). The next two digits are the code for the Accounting Unit (e.g. 041300, Southwestern Lake Ontario). The next two digits of the HUC are the Cataloging Unit (e.g. 04130003, Lower Genesee). Table 12: *Lower Genesee Watershed* lists the HUC-8 code for the watershed.

**Table 12: Lower Genesee Watershed**

HUC 8 Code	Name
04130003	Lower Genesee



**Figure 6: Lower Genesee Watershed**

## Bathymetry

FEMA will use data from the following bathymetric and topographic sources: For the topography, FEMA will use data flown by USACE on June 6 – September 23, 2011. The data have a 500-meter inland buffer from the shoreline along the lake, and also has bathymetric data in the collection. The data have a 2-meter point spacing with a 0.75-meter horizontal accuracy and a 20-centimeter root-mean-square error. These topographic datasets will be supplemented with topographic-bathymetric LiDAR data that USACE collected in 2011 and 2012 for use in the coastal study. The USACE LiDAR dataset has a 500-meter inland buffer from the shoreline along the lake and also has bathymetric data in the collection. Data gaps and insufficient coverages that may exist in the above mentioned datasets will be addressed by supplementing with older countywide datasets where available.

## Jurisdictional Boundaries

Jurisdictional boundaries were obtained from NYSDEC and are also available through the [New York State GIS Clearinghouse](#). During the Discovery Meetings, officials for the Town and

Village of Leicester in Livingston County noted changes to their jurisdictional boundaries. This information has been catalogued in FEMA's Coordinated Needs Management Strategy (CNMS).

## Shoreline Change Information

The Lower Genesee Watershed study area has approximately 1 mile of shoreline along Lake Ontario, contained within Monroe County. Portions of the shoreline may be vulnerable to coastal erosion through natural actions (runoff of surface water or groundwater seepage) and human intervention. Erosion is the loss of land near the coastline from exposure to water movement from wave action, currents, tides, wind driven water, ice, or other storm impacts. The coastline of Lake Ontario is at risk to coastal erosion from natural and human activities and is regulated. These areas are currently mapped as [coastal erosion hazard areas](#) (CEHAs) and require a CEHA permit (Article 34 Part 505) for any regulated activity.

Glacial isostatic adjustment (GIA), also known as post-glacial rebound, is the process whereby the earth's crust is slowly adjusting to the lack of the weight of the glaciers from the last ice age. Due to variations in the thickness of the glaciers, the timing of the glaciers receding, the geology of the region and other differences, the rate at which the earth's crust is adjusting varies throughout the Great Lakes region, with some areas rising faster than others and some areas even falling relative to other locations. This is reflected in the water levels of the Great Lakes. In general, the south shore of Lake Ontario is sinking relative to the lake's outlet, while the northeast shore of Lake Ontario is rising relative to the outlet. As a result, for the same-lake-wide average water level, over an extended period of decades or more, GIA means that, relative to the shoreline, water will appear deeper at certain locations, such as Rochester (+11 cm/century) and Oswego (+4.5 cm/century). ([International Joint Commission](#)) ([USACE](#))

In addition, runoff of surface water or groundwater seepage can cause erosion. During the Discovery Meetings, the Town and Village of Leicester County noted significant erosion along the Genesee River and Beards Creek. The Town of Irondequoit in Monroe County noted significant erosion along Lake Ontario in the Irondequoit Watershed, and within the small portion of the town located in the Lower Genesee Watershed (Genesee River) along the shoreline. The Town of Batavia in Genesee County experiences erosion along Tonawanda Creek on Main Street north of Route 15 and Stegman Street. The Genesee River in the southeast portion of Wyoming County experiences significant erosion which creates sediment deposits further downstream.

## Streamlines/Hydrograph

Streamlines, when available, were obtained from the effective FIRM Databases issued for the communities. Streamlines are representations of the most efficient flow of any river or stream. Natural channels flow along the path of least resistance and the streamline is a way to understand that flow system for modeling purposes. By definition, a hydrograph is a plot of the rate of flow (discharge) versus time past a specific point in a river or channel. Discharge is the volume of water flowing past a location per unit time (usually in cubic feet per second [cfs]). These two components are important for location of floods, forecasting floods, and severity of floods, and enable communities to be able to plan, mitigate, and prevent loss of life and property. For more information please visit the [National Weather Service](#).



## Topography

Topography is the description of surface shapes and features. The topographic data will be generated from LiDAR that has been collected to obtain elevation information. More information on LiDAR is available on [NOAA's website](#). LiDAR elevation data were only available for some portions of the project area at this time (there is currently an ongoing project to obtain the remainder of the data). Information about the coverage of LiDAR data in New York State is available at the [NYSGIS Clearinghouse](#).

## 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 applicable FIRM Databases and supplemented with data from communities and the New York State GIS Clearinghouse.

## Other Data and Information

### Biennial Report

FEMA collects data from communities participating in the NFIP through the Biennial Report process. This provides communities an opportunity to identify floodplain mapping needs and request assistance in implementing a floodplain management program. The Biennial Report provides FEMA with information on a community's floodplain management program and any changes in its SFHAs, which assists FEMA with evaluating the effectiveness of a community's floodplain management activities. The Biennial Report shows FEMA nationwide trends and patterns, which FEMA uses to help guide improvements to the NFIP. A FEMA fact sheet explaining the Biennial Report can be found on [FEMA's website](#).

### Regulatory Mapping

As noted above, the Lower Genesee Watershed in New York covers portions of five counties. The mapping in place is a mix of recently revised and older FIRMs.

Genesee County communities do not have a countywide FIRM. All communities in the county have community-based FIRMs with map dates ranging from 1978 to 1988.

Livingston County communities do not have a countywide FIRM. All communities in the county have community-based FIRMs with map dates ranging from 1978 to 2010.

A countywide digital FIRM was released in Monroe County on August 28, 2008. This countywide FIRM includes some of the communities in the Lower Genesee Watershed.

Ontario County communities do not have a countywide FIRM. All communities in the county have community-based FIRMs with map dates ranging from 1978 to 1998.

Wyoming County communities do not have a countywide FIRM. All communities in the county have community-based FIRMs with map dates ranging from 1981 to 1983.

The effective countywide FIRM for each of the participating communities is shown in **Error! Reference source not found.**: *FIRM/FIS Effective Dates*.

**Table 13: FIRM/FIS Effective Dates (as of August 2013)**

County	Coastal	Community	FIRM/FIS Effective Date	Notes
Genesee	No	Batavia, City of	9/16/1982	No countywide study  Effective community based Flood Insurance Studies' dates range from 1979-1988
		Batavia, Town of	1/17/1985 7/17/1984	
		Bergen, Town of	7/6/1984 None	
		Bergen, Village of	6/8/1979 None	
		Bethany, Town of	9/2/1984 None	
		Byron, Town of	2/1/1988 None	
		Elba, Town of	10/5/1984 None	
		Le Roy, Town of	9/14/1979 None	
		Le Roy, Village of	8/3/1981 2/3/1981	
		Pavilion, Town of	2/27/1984 None	
		Stafford, Town of	7/16/1982 None	
Livingston	No	Avon, Town of	8/15/1978 2/1/1978	No countywide study  Effective community based Flood Insurance Studies' dates range from 1978-2010
		Avon, Village of	8/1/1978 2/1/1978	
		Caledonia, Town of	6/1/1981	
		Caledonia, Village of	6/1/1981 12/1/1980	
		Conesus, Town of	2/15/1991	
		Geneseo, Town of	9/29/1996	
		Geneseo, Village of	9/29/1996	
		Groveland, Town of	2/15/1991	
		Leicester, Town of	1/20/1982 7/20/1981	
		Leicester, Village of	8/27/1982 None	
		Lima, Town of	12/23/1983 None	
		Lima, Village of	7/23/1982 None	
		Livonia, Town of	2/19/1992	
		Livonia, Village of	6/1/1988 None	

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 13: FIRM/FIS Effective Dates (as of August 2013)**

County	Coastal	Community	FIRM/FIS Effective Date	Notes
Livingston (cont'd)	No	Sparta, Town of	4/5/2010	See above
		Springwater, Town of	8/24/1984	
		York, Town of	None	
			1/20/1982	
Monroe	Yes	Irondequoit, Town of	8/28/2008	Effective countywide study 8/28/2008
	No	Brighton, Town of	8/28/2008	
		Chili, Town of	8/28/2008	
		Churchville, Village of	8/28/2008	
		Gates, Town of	8/28/2008	
		Henrietta, Town of	8/28/2008	
		Honeoye Falls, Village of	8/28/2008	
		Mendon, Town of	8/28/2008	
		Ogden, Town of	8/28/2008	
		Riga, Town of	8/28/2008	
		Rochester, City of	8/28/2008	
		Rush, Town of	8/28/2008	
		Scottsville, Village of	8/28/2008	
		Sweden, Town of	8/28/2008	
		Wheatland, Town of	8/28/2008	
Ontario	No	Canadice, Town of	5/15/1984 11/15/1983	No countywide study  Effective community based Flood Insurance Studies' dates range from 1978-1998
		Naples, Town of	6/8/1984 None	
		Richmond, Town of	12/18/1984 6/18/1984	
		South Bristol, Town of	5/18/1998 None	
		West Bloomfield, Town of	6/1/1978 12/1/1977	
Wyoming	No	Covington, Town of	12/23/1983 None	No countywide study  Effective community based Flood Insurance Studies' dates range from 1981-1983
		Gainesville, Town of	12/23/1983 None	
		Middlebury, Town of	None*	
		Orangeville, Town of	12/23/1983 None	
		Perry, Town of	12/23/1983 None	
		Warsaw, Town of	12/23/1983 None	
		Warsaw, Village of	11/18/1981 5/18/1981	
		Wyoming, Village of	8/3/1981 2/3/1981	

\*Not participating in the NFIP

## 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, proactive 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 Base Flood Elevations (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.

**Error! Reference source not found.:** *Program Status and Ordinance Level* lists the Program Status and Ordinance Level for each community.

**Table 14: Program Status and Ordinance Level (as of August 2013)**

County	Community	Program Status	Ordinance Level
Genesee	Batavia, City of	Regular	D
	Batavia, Town of	Regular	D
	Bergen, Town of	Regular	D
	Bergen, Village of	Regular	D
	Bethany, Town of	Regular	D
	Byron, Town of	Regular	D
	Elba, Town of	Regular	D
	Le Roy, Town of	Regular	D
	Le Roy, Village of	Regular	D
	Pavilion, Town of	Regular	D
Livingston	Stafford, Town of	Regular	D
	Avon, Town of	Regular	D
	Avon, Village of	Regular	D
	Caledonia, Town of	Regular	D
	Caledonia, Village of	Regular	D
	Conesus, Town of	Regular	D
	Geneseo, Town of	Regular	D
	Geneseo, Village of	Regular	D
	Groveland, Town of	Regular	D

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



**Table 14: Program Status and Ordinance Level (as of August 2013)**

County	Community	Program Status	Ordinance Level
Livingston (cont'd)	Leicester, Town of	Regular	D
	Leicester, Village of	Regular	D
	Lima, Town of	Regular	D
	Lima, Village of	Regular	D
	Livonia, Town of	Regular	D
	Livonia, Village of	Regular	D
	Sparta, Town of	Regular	D
	Springwater, Town of	Regular	D
	York, Town of	Regular	D
Monroe	Brighton, Town of	Regular	D
	Chili, Town of	Regular	D
	Churchville, Village of	Regular	D
	Gates, Town of	Regular	D
	Henrietta, Town of	Regular	D
	Honeoye Falls, Village of	Regular	D
	Irondequoit, Town of	Regular	D
	Mendon, Town of	Regular	D
	Ogden, Town of	Regular	D
	Riga, Town of	Regular	D
	Rochester, City of	Regular	D
	Rush, Town of	Regular	D
	Scottsville, Village of	Regular	D
	Sweden, Town of	Regular	D
	Wheatland, Town of	Regular	D
Ontario	Canadice, Town of	Regular	D
	Naples, Town of	Regular	D
	Richmond, Town of	Regular	D
	South Bristol, Town of	Regular	D
	West Bloomfield, Town of	Regular	D
Wyoming	Covington, Town of	Regular	D
	Gainesville, Town of	Regular	D
	Middlebury, Town of	Not Participating	-
	Orangeville, Town of	Regular	D
	Perry, Town of	Regular	D
	Warsaw, Town of	Regular	D
	Warsaw, Village of	Regular	D
	Wyoming, Village of	Regular	D

The NFIP-participating communities within the Project Area have floodplain management regulations in place and have a mechanism for updating their ordinances. Local ordinances are available in Appendix J: *Community Ordinances*.

## Flood Insurance Policies

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 element in making federally backed flood insurance available to home and business owners.

This Discovery project also gathered data regarding the NFIP flood insurance policies in the watershed. As of August 31, 2013, in the Lower Genesee Watershed 2,183 policies were in-force accounting for \$337 million in Insurance Coverage and \$1.9 million in written premiums. The number of policies, total coverage, and total premium cost are listed in Table 16: *Flood Insurance Policy and Claims Data*.

Monroe County represents nearly 63 percent of the total insurance policies and 66 percent of the coverage and premiums for the study area. The Town of Gates has 384 policies, followed by the Town of Irondequoit with 275 policies. The Towns of Brighton, Chili, Henrietta, and the City of Rochester all have many insurance policies in place. The Town of Henrietta has 194 policies with \$46 million in insurance coverage, which is the highest per policy coverage for the communities in the Monroe County study area.

Genesee County has 477 policies, \$53,745,100 in insurance coverage, and \$415,786 in written premiums. The Town of Bergen has three policies with a total coverage of \$680,500.

Livingston County has 196 policies, \$36,407,700 in insurance coverage, and \$152,861 in written premiums. The Town of Avon has two policies with a total coverage of \$780,000. The Village of Leicester has three policies with a total coverage of \$1,091,000.

Ontario County has 107 policies, \$22,863,300 in insurance coverage, and \$97,655 in written premiums.

Wyoming County has 26 policies, \$3,280,000 in insurance coverage, and \$21,233 in written premiums.

**Table 15: Flood Insurance Policy and Claims Data (as of August 2013)**

County	Community Name	Number of Policies	Insurance In-force whole \$	Written Premium In-force	Number of Claims	Totals Claims Paid
Genesee	Batavia, City of	400	\$44,553,100	\$350,807	48	\$ 93,986
	Batavia, Town of	36	\$4,078,000	\$32,564	15	\$ 59,069
	Bergen, Town of	3	\$680,500	\$3,386	2	\$ 2,245
	Bergen, Village of	1	\$8,000	\$77	0	\$ 0
	Bethany, Town of	4	\$620,000	\$2,912	0	\$ 0
	Byron, Town of	7	\$1,048,800	\$6,746	0	\$ 0
	Elba, Town of	3	\$201,500	\$1,715	0	\$ 0
	Le Roy, Town of	9	\$1,033,500	\$6,217	4	\$ 14,843
	Le Roy, Village of	13	\$1,468,700	\$10,791	2	\$ 4,879
	Pavilion, Town of	1	\$53,000	\$571	1	\$ 16
	Stafford, Town of	0	\$0	\$0	1	\$ 0
Livingston	Avon, Town of	2	\$780,000	\$2,775	1	\$ 0
	Avon, Village of	0	\$0	\$0	4	\$ 0
	Caledonia, Town of	2	\$459,800	\$1,412	7	\$ 23,476
	Caledonia, Village of	7	\$643,000	\$5,759	1	\$ 0
	Conesus, Town of	29	\$5,378,800	\$19,545	19	\$ 56,948
	Geneseo, Town of	47	\$8,931,200	\$34,431	10	\$ 10,058
	Geneseo, Village of	7	\$1,478,000	\$4,720	0	\$ 0
	Groveland, Town of	15	\$3,161,300	\$9,507	6	\$ 4,905
	Leicester, Town of	15	\$1,678,000	\$12,714	2	\$ 11,431
	Leicester, Village of	3	\$1,091,000	\$13,347	0	\$ 0
	Lima, Town of	6	\$1,281,300	\$4,000	1	\$ 0
	Lima, Village of	1	\$210,000	\$388	0	\$ 0
	Livonia, Town of	42	\$8,215,000	\$28,730	24	\$ 105,404
	Livonia, Village of	1	\$162,400	\$1,438	0	\$ 0
	Sparta, Town of	5	\$865,200	\$2,965	0	\$ 0

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 15: Flood Insurance Policy and Claims Data (as of August 2013)**

County	Community Name	Number of Policies	Insurance In-force whole \$	Written Premium In-force	Number of Claims	Totals Claims Paid
Livingston (cont'd)	Springwater, Town of	5	\$742,000	\$3,419	4	\$ 39,377
	York, Town of	9	\$1,330,700	\$7,711	2	\$ 2,137
Monroe	Brighton, Town of	111	\$21,793,400	\$96,611	23	\$ 47,591
	Chili, Town of	199	\$24,558,900	\$174,184	52	\$ 111,639
	Churchville, Village of	7	\$1,386,100	\$4,924	1	\$ 0
	Gates, Town of	384	\$54,216,100	\$417,570	38	\$ 49,341
	Henrietta, Town of	194	\$46,197,300	\$260,805	42	\$ 126,714
	Honeoye Falls, Village of	18	\$3,202,900	\$21,919	2	\$17,355
	Irondequoit, Town of	275	\$34,632,000	\$139,567	30	\$ 26,163
	Mendon, Town of	22	\$4,030,100	\$24,456	6	\$ 20,426
	Ogden, Town of	32	\$6,881,000	\$33,405	8	\$ 152,841
	Riga, Town of	6	\$693,800	\$4,757	6	\$ 1,476
	Rochester, City of	94	\$18,821,800	\$112,501	41	\$ 88,888
	Rush, Town of	11	\$1,998,300	\$6,390	3	\$ 1,850
	Scottsville, Village of	13	\$1,763,200	\$9,413	6	\$ 12,920
	Sweden, Town of	7	\$1,350,400	\$5,036	3	\$ 1,515
	Wheatland, Town of	18	\$2,282,400	\$11,179	19	\$ 393,176
Ontario	Canadice, Town of	25	\$4,567,500	\$15,575	3	\$ 7,648
	Naples, Town of	6	\$871,900	\$3,663	3	\$ 20,548
	Richmond, Town of	54	\$12,003,000	\$63,121	79	\$ 1,144,568
	South Bristol, Town of	22	\$5,420,900	\$15,296	23	\$ 177,298
	West Bloomfield, Town of	0	\$0	\$0	0	\$0
Wyoming	Covington, Town of	4	\$504,000	\$3,327	0	\$ 0
	Gainesville, Town of	2	\$132,100	\$1,322	1	\$ 1,513
	Middlebury, Town of	0	\$0	\$0	0	\$ 0
	Orangeville, Town of	2	\$211,800	\$995	0	\$ 0

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 15: Flood Insurance Policy and Claims Data (as of August 2013)**

County	Community Name	Number of Policies	Insurance In-force whole \$	Written Premium In-force	Number of Claims	Totals Claims Paid
Wyoming (Cont'd)	Perry, Town of	6	\$680,500	\$5,780	3	\$ 5,735
	Warsaw, Town of	4	\$749,700	\$3,379	6	\$ 11,094
	Warsaw, Village of	4	\$368,900	\$4,215	6	\$ 5,337
	Wyoming, Village of	4	\$633,000	\$2,215	0	\$ 0
Total		2,197	\$340,103,800	\$2,010,252	559	\$2,854,410

## Letters of Map Change (LOMC)

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 LOMC for their property or structure.

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 by property owners to amend the FIRM. It is important to note that 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, flood-control projects, or other larger-scale changes.

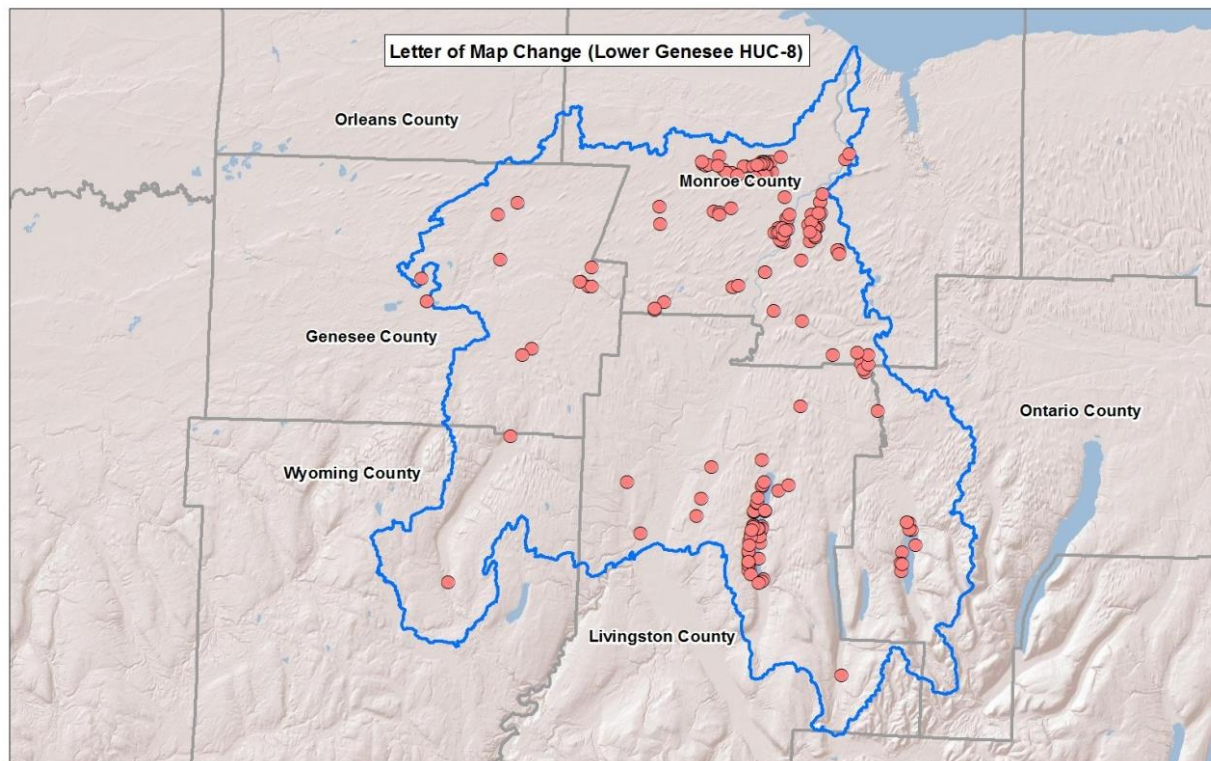


Table 16: *LOMCs in the Project Area* and Figure 7 highlight the areas within the Lower Genesee Watershed that have LOMCs. There are 211 LOMAs/LOMR-Fs and no LOMRs located in the Lower Genesee Watershed. Genesee County has 12 LOMCs. Livingston County has 67 LOMAs/LOMR-Fs, of which 29 are within the Town of Geneseo. Monroe County has 120 LOMCs; the Town of Henrietta has 48 LOMA/LOMR-Fs, followed by the Town of Gates with 37. Ontario County has 10 LOMAs/LOMR-Fs, of which the Town of Richmond has 6. Wyoming County has 2 LOMAs/LOMR-Fs.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

More information on the LOMA and LOMR-F processes can be found on FEMA's LOMC website at <http://www.fema.gov/letter-map-amendment-letter-map-revision-based-fill-process> or in hard copy by reviewing Attachment 4: *LOMA-LOMR-F Fact Sheet*, included with the digital copy of this Discovery Report.

**Table 16: LOMCs in the Project Area (as of August 2013)**

County	Community	Number of LOMA/ LOMR-Fs	Number of LOMRs	FIRM Effective Date
Genesee	Batavia, City of	1	0	9/16/1982
	Batavia, Town of	1	0	1/17/1985
	Bergen, Town of	0	0	7/6/1984
	Bergen, Village of	0	0	6/8/1979
	Bethany, Town of	0	0	9/2/1984
	Byron, Town of	2	0	2/1/1988
	Elba, Town of	0	0	10/5/1984
	Le Roy, Town of	6	0	9/14/1979
	Le Roy, Village of	0	0	8/3/1981
	Pavilion, Town of	0	0	2/27/1984
	Stafford, Town of	2	0	7/16/1982
Livingston  Livingston (Cont'd)	Avon, Town of	1	0	8/15/1978
	Avon, Village of	0	0	8/1/1978
	Caledonia, Town of	0	0	6/1/1981
	Caledonia, Village of	0	0	6/1/1981
	Conesus, Town of	4	0	2/15/1991
	Geneseo, Town of	29	0	9/29/1996
	Geneseo, Village of	2	0	9/29/1996
	Groveland, Town of	10	0	2/15/1991
	Leicester, Town of	1	0	1/20/1982
	Leicester, Village of	0	0	8/27/1982
	Lima, Town of	0	0	12/23/1983
	Lima, Village of	1	0	7/23/1982
	Livonia, Town of	17	0	2/19/1992
	Livonia, Village of	1	0	6/1/1988
	Sparta, Town of	0	0	4/5/2010
	Springwater, Town of	0	0	8/24/1984
	York, Town of	1	0	1/20/1982
Monroe	Brighton, Town of	3	0	8/28/2008
	Chili, Town of	9	0	8/28/2008
	Churchville, Village of	0	0	8/28/2008
	Gates, Town of	37	0	8/28/2008
	Henrietta, Town of	48	0	8/28/2008
	Honeoye Falls, Village of	2	0	8/28/2008
	Irondequoit, Town of	0	0	8/28/2008
	Mendon, Town of	5	0	8/28/2008
	Ogden, Town of	2	0	8/28/2008
	Riga, Town of	2	0	8/28/2008
	Rochester, City of	2	0	8/28/2008
	Rush, Town of	2	0	8/28/2008
	Scottsville, Village of	2	0	8/28/2008
	Sweden, Town of	0	0	8/28/2008

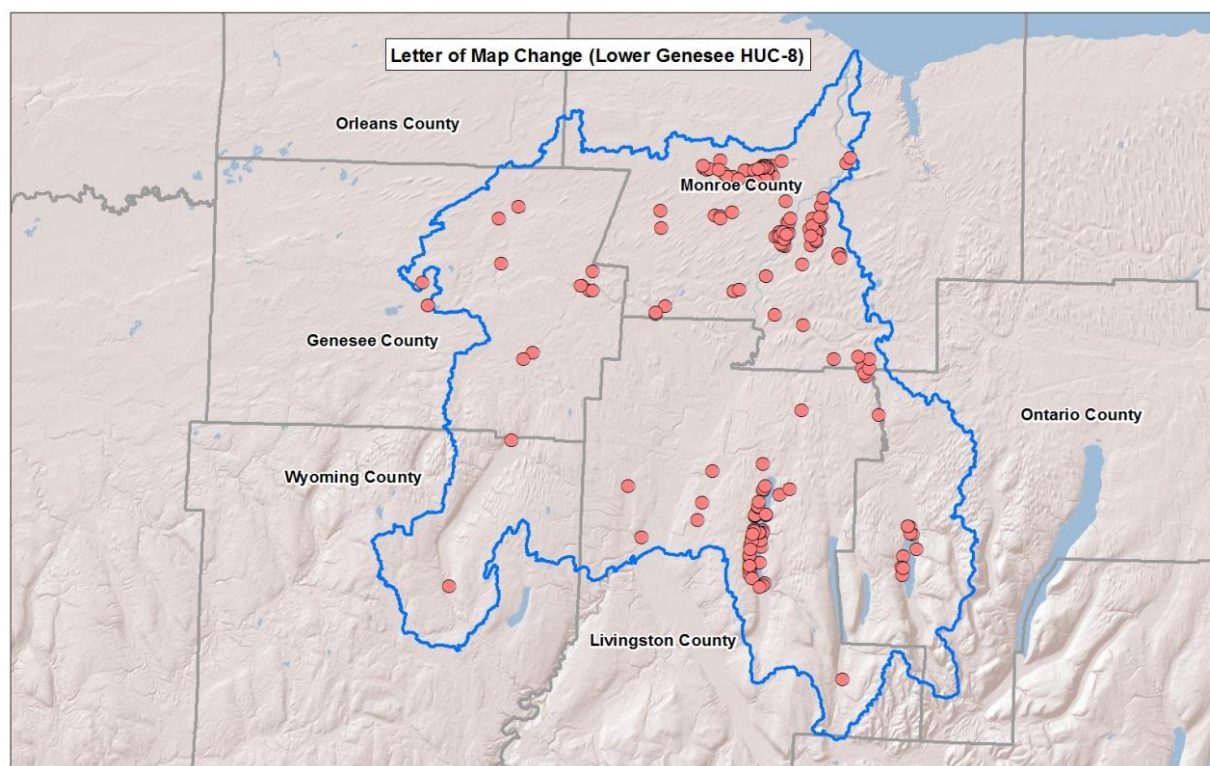
*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



**Table 16: LOMCs in the Project Area (as of August 2013)**

County	Community	Number of LOMA/ LOMR-Fs	Number of LOMRs	FIRM Effective Date
	Wheatland, Town of	6	0	8/28/2008
Ontario	Canadice, Town of	4	0	5/15/1984
	Naples, Town of	0	0	6/8/1984
	Richmond, Town of	6	0	12/18/1984
	South Bristol, Town of	0	0	5/18/1998
	West Bloomfield, Town of	0	0	6/1/1978
Wyoming	Covington, Town of	0	0	12/23/1983
	Gainesville, Town of	0	0	12/23/1983
	Middlebury, Town of	0	0	None*
	Orangeville, Town of	0	0	12/23/1983
	Perry, Town of	0	0	12/23/1983
	Warsaw, Town of	1	0	12/23/1983
	Warsaw, Village of	1	0	11/18/1981
	Wethersfield, Town of	0	0	8/3/1981
	Wyoming, Village of	0	0	11/18/1981

\* Not participating in the NFIP



**Figure 7: Location of LOMCs in the Lower Genesee Watershed**



## Community Assistance Visits (CAVs)

Statewide 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, other problems in community floodplain management, and problems with the Biennial Report data. CAVs are also a way to provide technical assistance to communities.

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.

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 standard in 44 CFR sections 60.3, 60.4, or 60.6. "Open" CAVs can be indicative of unresolved violations.

**Error! Reference source not found.:** *CAVs and CACs Performed Within the Project Area* lists the CAVs performed within the project area. No open CAVs were found for the communities in the Lower Genesee Watershed. Ordinances, enforcement or engineering violations made up the majority of issues noted for the CAVs. None of the communities needed remedial actions to close the CAV.

## Community Assistance Contacts (CACs)

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 the NFIP 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 effectively administering the NFIP in their community. **Error! Reference source not found.:** *CAVs and CACs Performed Within the Project Area* lists the CAVs and CACs performed within the project area.

**Table 17: CAVs and CACs Performed Within the Project Area (as of September 2013)**

County	Community	CAV Date	CAC Date
Genesee	Batavia, City of	6/6/2006	N/A

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 17: CAVs and CACs Performed Within the Project Area (as of September 2013)**

County	Community	CAV Date	CAC Date
	Batavia, Town of	6/6/2006	4/18/2007
	Bergen, Town of	N/A	N/A
	Bergen, Village of	N/A	N/A
	Bethany, Town of	N/A	N/A
	Byron, Town of	N/A	N/A
	Elba, Town of	N/A	N/A
	Le Roy, Town of	9/26/2006	3/17/1993
	Le Roy, Village of	5/1/1992	3/17/1993
	Pavilion, Town of	N/A	N/A
	Stafford, Town of	1/12/1994	7/8/1992
Livingston	Avon, Town of	N/A	N/A
	Avon, Village of	N/A	N/A
	Caledonia, Town of	10/10/1997	N/A
	Caledonia, Village of	2/17/1994	N/A
	Conesus, Town of	6/5/2003	N/A
	Geneseo, Town of	6/5/2003	6/19/2000
	Geneseo, Village of	12/15/1994	8/28/1995
	Groveland, Town of	6/5/2003	7/6/2007
	Leicester, Town of	5/7/2007	4/7/2005
	Leicester, Village of	1/10/1994	N/A
	Lima, Town of	12/2/1992	N/A
	Lima, Village of	12/4/1994	7/8/1992
	Livonia, Town of	6/5/2003	6/19/2000
	Livonia, Village of	6/5/2003	N/A
	Sparta, Town of	3/21/2003	2/5/2009
	Springwater, Town of	N/A	N/A
	York, Town of	5/7/2006	N/A
Livingston (Cont'd)	Brighton, Town of	7/24/2004	N/A
	Chili, Town of	6/26/2006	2/23/2010
	Churchville, Village of	12/5/2000	N/A
	Gates, Town of	7/22/2003	12/2/2008
	Henrietta, Town of	3/15/2013	N/A
	Honeoye Falls, Village of	9/10/2010	6/22/2007
	Irondequoit, Town of	3/26/2008	N/A
	Mendon, Town of	9/13/2007	N/A
	Ogden, Town of	6/15/2010	N/A
Monroe	Brighton, Town of	7/24/2004	N/A
	Chili, Town of	6/26/2006	2/23/2010
	Churchville, Village of	12/5/2000	N/A
	Gates, Town of	7/22/2003	12/2/2008
	Henrietta, Town of	3/15/2013	N/A
	Honeoye Falls, Village of	9/10/2010	6/22/2007
	Irondequoit, Town of	3/26/2008	N/A
	Mendon, Town of	9/13/2007	N/A
	Ogden, Town of	6/15/2010	N/A

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 17: CAVs and CACs Performed Within the Project Area (as of September 2013)**

County	Community	CAV Date	CAC Date
	Riga, Town of	6/15/2010	N/A
	Rochester, City of	2/27/2013	10/2/2012
	Rush, Town of	3/21/1991	N/A
	Scottsville, Village of	7/21/2009	N/A
	Sweden, Town of	N/A	N/A
	Wheatland, Town of	5/22/2003	11/10/2009
Ontario	Canadice, Town of	5/29/1991	N/A
	Naples, Town of	9/13/2006	6/11/2013
	Richmond, Town of	1/22/2008	N/A
	South Bristol, Town of	7/8/2004	N/A
	West Bloomfield, Town of	N/A	N/A
Wyoming	Covington, Town of	N/A	N/A
	Gainesville, Town of	N/A	6/2/1999
	Middlebury, Town of	N/A	N/A
	Orangeville, Town of	11/5/2009	N/A
	Perry, Town of	12/12/2006	N/A
	Warsaw, Town of	1/8/1992	3/21/1996
	Warsaw, Village of	8/14/2007	10/30/2002
	Wyoming, Village of	12/30/1991	N/A

## Community Rating System (CRS)

The 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.

For more information on CRS, please see Attachment 5: *Joining the CRS Program*, or visit FEMA's [CRS website](#).

Joining the NFIP's CRS program would be of benefit to all watershed communities. There seems to be a great deal of misinformation and lack of communication as to what the CRS is, if a community is eligible for membership, and what level of effort is required to make CRS

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

participation beneficial for a community. Local communities may wish to consider pooling resources and efforts or work on a countywide basis to ease the effort of complying with the requirements of joining the CRS program.

## 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 10-year period. In the Lower Genesee Watershed there were 68 RLs within the study area as of April 2015, accounting for \$1,281,940 in claims paid; 22 percent of the total claims are located in Ontario County (15 RLs) and 54 percent of the total claims are located in Monroe County (37 RLs). The Town of Wheatland in Monroe County has experienced 18 RLs with \$491,805 claims paid. The Town of Richmond in Ontario County has experienced 13 RLs with \$508,325 in claims paid. The data are shown in **Error! Reference source not found.:** *Repetitive Losses in Study Area*.

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 10-year period, and must be greater than 10 days apart. There are no SRL properties within the Lower Genesee Watershed.

**Table 18: Repetitive Losses in Study Area (as of April 2015)**

County	Community	Number of Losses	Total Claims Paid
Genesee	Batavia, City of	6	\$25,390
	Batavia, Town of	2	\$18,608
	Bergen, Town of	0	\$0
	Bergen, Village of	0	\$0
	Bethany, Town of	0	\$0
	Byron, Town of	0	\$0
	Elba, Town of	0	\$0
	Le Roy, Town of	0	\$0
	Le Roy, Village of	0	\$0
	Pavilion, Town of	0	\$0
	Stafford, Town of	0	\$0
Livingston	Avon, Town of	0	\$0
	Avon, Village of	0	\$0
	Caledonia, Town of	2	\$11,220
	Caledonia, Village of	0	\$0
	Conesus, Town of	0	\$0
	Geneseo, Town of	0	\$0
	Geneseo, Village of	0	\$0
	Groveland, Town of	0	\$0
	Leicester, Town of	0	\$0
	Leicester, Village of	0	\$0

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 18: Repetitive Losses in Study Area (as of April 2015)**

County	Community	Number of Losses	Total Claims Paid
	Lima, Town of	0	\$0
	Lima, Village of	0	\$0
	Livonia, Town of	4	\$24,911
	Livonia, Village of	0	\$0
	Sparta, Town of	0	\$0
	Springwater, Town of	0	\$0
	York, Town of	0	\$0
Monroe	Brighton, Town of	2	\$9,896
	Chili, Town of	4	\$11,486
	Churchville, Village of	0	\$0
	Gates, Town of	2	\$4,162
	Henrietta, Town of	0	\$0
	Honeoye Falls, Village of	0	\$0
	Irondequoit, Town of	2	\$17,810
	Mendon, Town of	0	\$0
	Ogden, Town of	2	\$109,263
	Riga, Town of	0	\$0
	Rochester, City of	7	\$34,296
	Rush, Town of	0	\$0
	Scottsville, Village of	0	\$0
	Sweden, Town of	0	\$0
	Wheatland, Town of	18	\$491,805
Ontario	Canadice, Town of	0	\$0
	Naples, Town of	0	\$0
	Richmond, Town of	13	\$508,325
	South Bristol, Town of	2	\$9,431
	West Bloomfield, Town of	0	\$0
Ontario (Cont'd)			
Wyoming	Covington, Town of	0	\$0
	Gainesville, Town of	0	\$0
	Middlebury, Town of	0	\$0
	Orangeville, Town of	0	\$0
	Perry, Town of	0	\$0
	Warsaw, Town of	0	\$0
	Warsaw, Village of	2	\$5,337
	Wyoming, Village of	0	\$0
Total		68	\$1,281,940

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. Areas of Mitigation Interest (AoMI) is

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

a non-regulatory flood risk dataset that shows the items that have an impact (positive or negative) on the identified flood hazards or flood risks. This dataset is an enhanced Risk MAP product.

## Historical Flooding

Throughout the recorded history of the Lower Genesee Watershed, flooding has been a constant threat. Floods in the early summer months are often associated with tropical storms moving north along the Atlantic coast. During the winter, flooding has been a threat when ice jams impede the free flow of floodwaters. Tropical Storm Agnes caused extensive flooding throughout the study area in 1972. As a result, 12 counties were declared disaster areas.

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. **Error! Reference source not found.: FIS Historical Flooding Areas** summarizes the historical flooding noted in each community's FIS report.

**Table 19: FIS Historical Flooding Areas**

County	Community	Event Date	Areas of Concern
Genesee	Batavia, City of	March 1, 1942	Flooding along Tonawanda Creek occurred as a consequence of heavy spring rains or spring thaw conditions in the hill area south of the city.
	Batavia, Town of	1961	Tonawanda Creek flooded due to spring overflow on Walnut Street, Law Street, and South Main Street resulting in the flooding of several residences.
Livingston	Avon, Town of Avon, Village of Caledonia, Town of Caledonia, Village of Conesus, Town of Geneseo, Town of Geneseo, Village of Groveland, Town of Leicester, Town of Leicester, Village of Livonia, Town of Sparta, Town of York, Town of	June 1972	Tropical Storm Agnes caused extensive flooding throughout the communities in Livingston County. As a result, 12 counties were declared disaster areas. The Genesee River Basin was subjected to approximately \$50 million in damages. The magnitude of this flood in the lower basin ranged from a 10-year storm at Rochester, to a 60-year storm at the Jones Bridge gage. In the upper basin, the flood's magnitude ranged from a 35-year storm at Shongo, to a 25-year storm at Portageville. Tropical Storm Agnes produced the largest flood flow recorded in the area.
Monroe	Irondequoit, Town of	1864 and various dates since	Major floods on Irondequoit Creek can occur during any season of the year. Several serious floods have occurred involving Irondequoit Creek dating back to 1864 when the largest, most extensive flood to date caused considerable

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 19: FIS Historical Flooding Areas**

County	Community	Event Date	Areas of Concern
			damage. The most damaging floods of Lake Ontario and Irondequoit Bay occur during high water levels caused by major changes in the cycle of precipitation.
	Brighton, Town of, Henrietta, Town of Rochester, City of Rush, Town of	March 1865 and various dates since	Flooding problems along the Genesee River are most apparent in the low-lying areas close to the river, where high water periodically inundates residences and summer cabins. Most major floods have occurred in late winter or early spring as a result of snowmelt and/or rainfall. The largest known flood occurred in March 1865, and had an estimated discharge of 54,000 cubic feet per second (cfs).
	Gates, Town of Ogden, Town of	1913 and various dates since	Most of the flooding problems associated with the Little Black Creek watershed are due to limited channel capacity and undersized culverts. Severe floods in the Little Black Creek watershed occurred in the springs of 1913, 1960, and 1974.
	Chili, Town of Churchville, Village of Riga, Town of	1950 and various dates since	There have been several recorded flood events on the Black Creek. These occurred in 1950, 1956, 1960, and 1963. The 1960 flood was the more severe with flows slightly less than the projected 2-percent annual chance (50-year) storm event, as was the 1950 flood. Not only do bridges aggravate flooding, but also the stream configuration. Black Creek has many bends and is lined with heavy brush, weeds, and large trees that extend into the stream.
	Scottsville, Village of Wheatland, Town of	March 31, 1960	Flooding occurs on Oatka Creek in late winter and early spring as a result of heavy rainfall combined with snow melt. The maximum flow recorded was 7,050 cfs on March 31, 1960, while the corresponding flood elevation was 569.5 feet.
	Mendon, Town of	June 21-23, 1972	The principal flooding sources in the Town of Mendon are Honeoye Creek and Irondequoit Creek and the primary tributaries into these two creeks. Heavy rains, especially those in the spring, combined with snowmelt, have frequently led to high water and flooding. Tropical Storm Agnes rained approximately 4.5 inches in a three day period. On Honeoye Creek the maximum recorded discharge was 4,800 cubic feet per second (cfs) with a recurrence interval of approximately 30-years.
Ontario	West Bloomfield, Town of	June 1972	The most severe flood, resulting from Tropical Storm Agnes, subjected the Genesee River Basin to approximately \$50 million in damages. The magnitude of this flood in the lower basin ranged from a 10-year storm at Rochester, to a 60-year storm at the Jones Bridge gage. In the upper basin, the flood's magnitude ranged from a 35-year storm at Shongo, to a 25-year storm at Portageville. Tropical Storm Agnes produced the largest flood flow recorded in the area.
Wyoming	Warsaw, Village of	March 1, 1955	On this date one of the worst floods of record occurred in Warsaw. This event caused extensive damage and many buildings along Oatka Creek were inundated.



**Table 19: FIS Historical Flooding Areas**

County	Community	Event Date	Areas of Concern
	Wyoming, Village of	Various	Oatka Creek overflows its banks every spring and inundates the valley floor, a result of snowmelt compounded by precipitation. Flooding is aggravated by siltation and debris.

Historical flooding events were also included in several of the HMPs. Significant events from these plans are summarized in **Error! Reference source not found.: Hazard Mitigation Plan Significant Flood Events**. All of the HMPs included a brief countywide description for flood events but did not include specific community impacts.

See the Hazard Mitigation subsection that follows for additional information on HMPs.

**Table 20: Hazard Mitigation Plan Significant Flood Events**

County	Community Name	Flood Events of Significance
Genesee	Batavia, City of	March 1942: Overflow of the Tonawanda Creek caused residents to be stranded in their homes for more than 3 days, and many homes were incapacitated.
		June 1996: Flash flooding led to road closures and basement damage near \$40,000.
		June 1998: Flash flooding from thunderstorms
	Batavia, Town of	March 1902: Ice jams caused major flooding and street closures
		March 1916: Rain and snowmelt caused one of the Town's greatest floods of all time
	Bergen, Town of	No event details
	Bergen, Village of	No event details
	Bethany, Town of	June 1989: Severe flash flooding from a major rainstorm led to damaged roads and bridges. Damage estimates at \$122,500.
	Byron, Town of	No event details
	Elba, Town of	No event details
Genesee (Cont'd)	Le Roy, Town of	June 1995: 2.5 inches of rain fell in 1 hour causing urban flooding. Damage estimates near \$15,000.
		January 1989: Rainfall caused many small streams and creeks to flood, overwhelming several area wastewater treatment plants Damage estimates near \$10,000.
	Le Roy, Village of	No event details



**Table 20: Hazard Mitigation Plan Significant Flood Events**

County	Community Name	Flood Events of Significance
	Pavilion, Town of	May 1916: Major flooding resulted in water inundation up to 8 feet and the closing of the railroad.  June 1989: Severe flash flooding from a major rainstorm led to damaged roads and bridges. Damage estimates at \$115,000
	Stafford, Town of	June 1989: Severe flash flooding from a major rainstorm led to damaged roads and bridges. Damage estimates near \$20,000.
Livingston	Avon, Town of	1972: Serious flooding from Hurricane Agnes caused problems with sewage treatment and led to evacuations.
	Avon, Village of	No event details
	Caledonia, Town of	1993: Rains caused flooding, power outages, and septic system failures, which resulted in a State of Emergency declaration for the Town.  January 1998: 2 to 4 inches of rain fell on saturated ground within a 36-hour period, which led to urban flooding, overflowing of local streams and creeks, road closures, and overwhelming of wastewater treatment plants
	Caledonia, Village of	No event details
	Conesus, Town of	November 1977: Flooding of Conesus Lake damaged roads and led to dredging and installation of a gate-operated flood control structure. Damages at \$1.5 million.  May 2004: 3 inches of rain fell in less than 1 hour, leading to road closures and residential damage close to \$200,000.
	Geneseo, Town of	1972: Flooding from Hurricane Agnes 2004: Heavy rain caused Jaycox Creek to overflow
	Geneseo, Village of	
	Groveland, Town of	No event details
	Leicester, Town of	No event details
	Leicester, Village of	No event details
	Lima, Town of	1977: Flooding destroyed the potato crop in the southern part of Town resulting in damages at \$500,000
	Lima, Village of	No event details
	Livonia, Town of	1972: Widespread flooding from Hurricane Agnes caused drinking water problems and damaged homes.
	Livonia, Village of	No event details
	Sparta, Town of	1998: Flooding caused a wash out resulting in damages at \$200,000.
	Springwater, Town of	
	York, Town of	No event details
Livingston (Cont'd)		

**Table 20: Hazard Mitigation Plan Significant Flood Events**

County	Community Name	Flood Events of Significance
Monroe	Brighton, Town of	<p>County level events included:</p> <p>October 1974: A sewer tunnel cracked and caused flooding, which damaged homes, destroyed roads, and displaced residents. The event resulted in millions in damages.</p> <p>May 2000: Heavy rains and hail caused substantial erosion of a roadway. Damages estimated at \$180,000.</p> <p>September 2004: Hurricane Frances caused widespread and significant flooding, causing multiple State of Emergency declarations, evacuations, and road closures. Damages estimated over \$2.5 million.</p> <p>July 2006: Rains overflowed creeks, flooded basements, and created sinkholes - including one very large crater from a drainage system implosion.</p>
	Chili, Town of	
	Churchville, Village of	
	Gates, Town of	
	Henrietta, Town of	
	Honeoye Falls, Village of	
	Irondequoit, Town of	
	Mendon, Town of	
	Ogden, Town of	
	Riga, Town of	
	Rochester, City of	
	Rush, Town of	
	Scottsville, Village of	
	Sweden, Town of	
	Wheatland, Town of	
Ontario	Canadice, Town of	<p>County level events occurred during March 1993, January 1996, January 1998, January 2003, and August 2003. No event specific details provided.</p>
	Naples, Town of	
	Richmond, Town of	
	South Bristol, Town of	
	West Bloomfield, Town of	
Wyoming	Covington, Town of	No event details
	Gainesville, Town of	No event details
	Middlebury, Town of	No event details
	Orangeville, Town of	June 2005: 5-6 inches of rain fell and caused Tonawanda Creek to rise 2 feet and flood.
	Perry, Town of	<p>Mat 1972: Flooding washed tons of topsoil across one of the Town's major roadways.</p> <p>August 2003: Thunderstorms dropped several inches of rain and led to flooding.</p>
	Warsaw, Town of	<p>April 1916: Heavy rains raised stream levels, caused significant stormwater runoff, and flooded many areas in the Town.</p> <p>1937: Crystal Brook flooded at the end of the rainy season.</p>
	Warsaw, Village of	1945 & 1955: Flooding occurred along Oatka Creek due to an ice jam.
	Wyoming, Village of	May 2000: Several inches of rain fell on saturated ground, which caused flooding.

## Declared Disasters

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 Hurricane Irene and remnants of Tropical Storm Lee, which struck the area in August and September 2011.

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 **Error! Reference source not found.: Disaster Declarations**. Since 1972 there have been 12 flood-related declared disasters within the study area. FEMA's disaster and emergency declarations history can be viewed at [FEMA's website](#).

**Table 21: Disaster Declarations (as of August 2013)**

Date	Title of Event	Number of Counties Declared within Study Area
June 1972	Tropical Storm Agnes	4
March 1973	New York High Winds, Wave Action, Flooding	2
March 1976	New York Ice Storm, Severe Storms, Flooding	3
January 1996	New York Severe Storms and Flooding	2
June and July 1998	New York Severe Storms and Flooding	3
September 1998	New York Severe Storms	3
May to August 2000	New York Severe Storms	2
July and August 2003	New York Severe Storms, Tornadoes, and Flooding	3
May and June 2004	New York Severe Storms and Flooding	1
August and September 2004	New York Severe Storms and Flooding	2
October 2006	New York Severe Storms and Flooding	1
April and May 2011	New York Severe Storms, Flooding, Tornadoes, and Straight Line Winds	3

During the Discovery Meetings, several communities noted significant flood events in their communities that caused significant flooding:

Hurricane Agnes in 1972 caused extensive flooding throughout Livingston County, including several road closures and flooding on Chandler Road along the Genesee River in the Town of York. The Town of Richmond, in Ontario County also experienced a flood disaster as a result of Hurricane Agnes.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

The Village of Wyoming in Wyoming County has experienced historic flood events along Village Creek and Oatka Creek. No specific locations or damages were provided.

The City of Batavia reported major flood events in 1942, 1947, 1950, 1955, 1956, 1960, 1985, and 1998. No specific locations or damages were provided.

Livingston County was impacted by a flood event in July and August 2003 (FEMA DR 1486 NY) that impacted the southern half of the county and caused \$42 million in damages.

The Town of Leicester experienced a flood disaster in 2007 and subsequently repaired Covington Road to reduce future flood losses.

The Town of South Bristol in Ontario County included flood events from April 2011 (FEMA DR 1993 NY) that impacted Bills Road, Mosher Road, Gulick Road, Fribolin, Gannet Hill Road, and the Canandaigua Lake shoreline on Seneca Point Road. The Town of Richmond in Ontario County also experienced flooding of roads and homes in the southern part of the Town along Honeoye Lake due to the 2011 storm. Superstorm Sandy caused erosion along the Lake Ontario shoreline that impacted the City of Rochester and the Town of Irondequoit in Monroe County.

The information provided by the communities did not include specific dates of events and/or damages.

### *High Water Marks*

A limited number of verified High Water Mark (HWM) data were available from USGS or USACE prior to the Discovery Meeting. During the pre-Discovery and Discovery Meetings, communities were asked about additional known HWMs. Information obtained from the meetings included Salt Creek at Genesee and Flats Road in the Town of York, Livingston County. A HWM was provided for Grass Creek in the Town of Brighton (Monroe County). Oatka Creek in the Town of Middleburg, Wyoming County has several HWMs. The Court Street Bridge in the Village of Warsaw has a NYSDEC HWM. The Town of Wheatland noted several HWMs along the Rodney Farm boat launch, Old Mill Race, new Scott Crescent Street, and Blue Pond. No specific details were provided for the HWMs noted by the communities.

### *Ice Jams*

As explained by 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.”

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.

#### **Break Up Jam Criteria:**

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

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:

$$(T_{\text{max}} (\text{maximum temperature}) + T_{\text{min}} (\text{minimum temperature}))/2.$$

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.

It is critically important to note that 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.

Known "trouble spots" of ice jamming in the watershed include areas along the Genesee River in the Town and Village of Avon, Town of Brighton, Town of Leicester, and the City of Rochester; Tonawanda Creek in the City of Batavia; Honeoye Creek in the Village of Honeoye Falls; Canaseraga Creek in the Town of Groveland; Oatka Creek in the Village of Scottsville and the Village of Warsaw; and Black Creek in the Village of Churchville. The complete list with full descriptions of the circumstances of jamming at each location can be found on the [USACE website](#).

#### Ice Jam Preparedness

1. Monitoring areas to identify problem areas early
2. Alert system for evacuation
3. Mitigation
  - a. Ice weakening/thinning/removal
  - b. Equipment placement
  - c. Supplies including sandbags and jersey barriers
4. Permanent Measures
  - a. Freeze up Jam Control
    1. Displace jam location
    2. Control production and transport of frazil ice (ice crystals formed in swift streams or rough seas)
  - b. Break up Jam Control
    1. Control timing of breakup
    2. Displace jam location

## Hazard Mitigation Plans (HMPs)

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.

The county and local HMPs outline mitigation actions that officials believe are attainable and can be implemented. Some of these activities include:

- Reduce the number or vulnerability of critical facilities in hazard-prone areas.
- Reduce the future development of facilities in flood inundation zones.
- Map all critical facilities in SFHAs.
- Raise structures located in flood-prone areas.
- Require flood resistant building construction methods.
- Develop plan to relocate critical facilities to safer areas.

### *Status of Approved Mitigation Plans*

As of June 30, 2013, 175 communities within the Lake Ontario Watershed had approved HMPs; 46 of the HMPs expired in fall 2013. NYSDHSES reviews the local HMPs prior to FEMA review and approval. These plans identify potential hazards and threats that face the 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 (HMGP). There are numerous advantages to mitigation planning. The creation of a mitigation plan helps local officials identify potential future hazards. Once the threats are identified, the communities can identify mitigation actions, 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 their 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 **Error! Reference source not found.: Approved Hazard Mitigation Plans**. Communities without an HMP may be in the process of developing a plan. Local HMPs are required to be updated every 5 years and revised to include recent events, new analysis, and best available data.

**Table 22: Approved Hazard Mitigation Plans (as of June 2013)**

County	Jurisdiction Name	Approval Date	Plan Expiration
Genesee	Batavia, City of	8/23/2011	8/23/2016
	Batavia, Town of		
	Bergen, Town of		
	Bergen, Village of		
	Bethany, Town of		
	Byron, Town of		
	Elba, Town of		
	Le Roy, Town of		
	Le Roy, Village of		
	Pavilion, Town of		
	Stafford, Town of		
Livingston  Livingston (Cont'd)	Avon, Town of	9/23/2008	9/23/2013
	Avon, Village of		
	Caledonia, Town of		
	Caledonia, Village of		
	Conesus, Town of		
	Geneseo, Town of		
	Geneseo, Village of		
	Groveland, Town of		
	Leicester, Town of	9/23/2008	9/23/2013
	Leicester, Village of		
	Lima, Town of		
	Lima, Village of		
	Livonia, Town of		
	Livonia, Village of		
	Sparta, Town of		
	Springwater, Town of		
	York, Town of		
Monroe	Brighton, Town of	8/15/2011	8/15/2016
	Chili, Town of		
	Churchville, Village of		
	Gates, Town of		
	Henrietta, Town of		
	Honeoye Falls, Village of		
	Irondequoit, Town of		
	Mendon, Town of		
	Ogden, Town of		
	Riga, Town of		

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



**Table 22: Approved Hazard Mitigation Plans (as of June 2013)**

County	Jurisdiction Name	Approval Date	Plan Expiration
	Rochester, City of		
	Rush, Town of		
	Scottsville, Village of		
	Sweden, Town of		
	Wheatland, Town of		
Ontario	Canadice, Town of	1/28/2010	1/28/2015
	Naples, Town of		
	Richmond, Town of		
	South Bristol, Town of		
	West Bloomfield, Town of		
Wyoming	Covington, Town of	8/28/2008	8/28/2013
	Gainesville, Town of		
	Middlebury, Town of		
	Orangeville, Town of		
	Perry, Town of		
Wyoming (Cont'd)	Warsaw, Town of	8/28/2008	8/28/2013
	Warsaw, Village of		
	Wyoming, Village of		

### **Critical Facilities and Infrastructures**

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.

**Error! Reference source not found.:** *Critical Facilities and Infrastructure at risk of Flooding in the Lower Genesee Watershed* summarizes the critical facilities that were noted in the HMPs as being at risk to flood-related events. Updates to these plans will need to include the critical structure vulnerability.

Thirteen facilities are located within the SFHA in Genesee County, with six of the facilities in the City of Batavia. Nine facilities are shown to be within the SFHA in Livingston County and one in the Town of Richmond, Ontario County. Wyoming County communities listed 18 facilities within the SFHA. The HMPs currently do not include specific attributes or information related to facility type or flooding source.

In addition to the data shown in the table, the Town of York in Livingston County noted their water treatment facility was located within the SFHA of Bidwells Creek, as well as a chemical plant on Salt Creek.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 23: Critical Facilities and Infrastructure at risk of Flooding in the Lower Genesee Watershed (as of June 2013)**

County	Community	Facilities Located within SFHA
Genesee	Batavia, City of	6 facilities
	Batavia, Town of	2 facilities
	Bergen, Town of	0 facilities
	Bergen, Village of	1 facility
	Bethany, Town of	0 facilities
	Byron, Town of	1 facilities
	Elba, Town of	1 facility
	Le Roy, Town of	0 facilities
	Le Roy, Village of	0 facilities
	Pavilion, Town of	2 0 facilities
	Stafford, Town of	0 facilities
Livingston	Avon, Town of	None Listed
	Avon, Village of	None Listed
	Caledonia, Town of	None Listed
	Caledonia, Village of	None Listed
	Conesus, Town of	None Listed
	Geneseo, Town of	3 facilities
	Geneseo, Village of	None Listed
	Groveland, Town of	1 facility
	Leicester, Town of	None Listed
	Leicester, Village of	None Listed
	Lima, Town of	None Listed
	Lima, Village of	None Listed
	Livonia, Town of	5 facilities
	Livonia, Village of	None Listed
	Sparta, Town of	None Listed
	Springwater, Town of	None Listed
	York, Town of	None Listed
Monroe	Brighton, Town of	None Listed
	Chili, Town of	
	Churchville, Village of	
	Gates, Town of	
	Henrietta, Town of	
	Honeoye Falls, Village of	
	Irondequoit, Town of	

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 23: Critical Facilities and Infrastructure at risk of Flooding in the Lower Genesee Watershed (as of June 2013)**

County	Community	Facilities Located within SFHA
	Mendon, Town of	
	Ogden, Town of	
	Riga, Town of	
	Rochester, City of	
	Rush, Town of	
	Scottsville, Village of	
	Sweden, Town of	
	Wheatland, Town of	
Ontario	Canadice, Town of	None Listed
	Naples, Town of	None Listed
	Richmond, Town of	1 facility
Ontario (Cont'd)	South Bristol, Town of	None Listed
	West Bloomfield, Town of	None Listed
Wyoming	Covington, Town of	1 facility
	Gainesville, Town of	5 facilities
	Middlebury, Town of	3 facilities
	Orangeville, Town of	None Listed
	Perry, Town of	5 facilities
	Warsaw, Town of	4 facilities
	Warsaw, Village of	None Listed
	Wyoming, Village of	None Listed

### **Mitigation Projects**

FEMA has five programs that fund hazard mitigation projects. These programs may be beneficial to water and wastewater utilities. Some may be implemented before a disaster strikes (referred to as pre-disaster mitigation) and others after a disaster is declared (referred to as post-disaster mitigation). FEMA's disaster mitigation funding programs include:

- Pre-Disaster Mitigation Program (PDM);
- Hazard Mitigation Grant Program (HMGP);
- Public Assistance Grant Program (PAGP);
- Flood Mitigation Assistance Program (FMA); and
- Repetitive Flood Claims Program (RFC).

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 vulnerability.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

County level mitigation actions were provided for Genesee County. Mitigation actions include FIRM updates, participation in the CRS, creation of a municipal flood/drainage program, countywide survey of RL properties to develop mitigation options, raising minimum BFE requirements, assisting with flood mitigation for citizens, and conducting an assessment of dams with replacement of faulty flood-control devices.

Livingston County included countywide mitigation strategies for restricting development in the floodplain, protection of wetlands, updates to FIRMs, program development and creation of prevention ordinances and sediment/erosion control. Several mitigation actions include maintenance of stormwater structures.

Monroe County communities included a diverse mitigation strategy for drainage improvements, GIS capabilities for modeling inundation, joining the CRS, and buyouts of repetitive flooding areas. The Town of Gates included mitigation actions for developing multi-lot LOMAs. The Town of Henrietta included several stormwater actions and drainage studies for Allens and Red Creeks. Based on the information provided in the data worksheets, the Town of Brighton in Monroe County has completed several mitigation activities including removing structures from the Dugway/Blossom Road area in the northeast part of the town.

Ontario County included mitigation actions for each community related to zoning regulations, administration of a Flood Damage Prevention law, sediment and erosion control, emergency preparedness planning, and mitigation of structures. County-wide actions include updating FIRMs, participation in the CRS, and identifying/analyzing mitigation options for RL properties in the county.

The Wyoming County plan focuses on stormwater, flood and drainage planning and management, assessing the viability of participating in the CRS, and flood warning systems. The Town of Middlebury includes the creation of an inter-municipal flood and erosion control program to address issues along Oatka Creek. Many of these activities noted above would qualify for CRS credits.

## **Municipal Separate Storm Sewer Systems (MS4s)**

Two pieces of legislation in the early 1970s—the Clean Water Act and the Safe Drinking Water Act—have contributed mightily to the quality of the water we drink, fish, and swim in today. Prior to enactment of these landmark laws, as much as two-thirds of the surface water in the United States was considered polluted. The Nation’s waters are noticeably cleaner and less polluted, and today, we can fish and swim in virtually all our streams, rivers, lakes, and oceans.

Water resources are central to the region’s aesthetics, economics, and health. There are some 60,000 miles of rivers and streams in FEMA Region II, including the waterways of the St. Lawrence Seaway. We all live in a watershed. Many water quality and ecosystem problems are best solved at the watershed level rather than at the individual water body or discharger level. Due to our geographic diversity, New York has a wide variety of water bodies and a number of programs to protect its estuaries, lakes, rivers and streams, wetlands, and oceans more efficiently and effectively.

As noted on 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 [NYSDEC's website](#).

There have been 32 MS4 permits issued in the Lower Genesee Watershed area—27 in Monroe County and 5 in Ontario County.

Detailed maps that depict where the regulated MS4 boundaries lie can be found on [NYSDEC's website](http://www.dec.ny.gov/chemical/92258.html)<http://www.dec.ny.gov/chemical/92258.html>.

## CNMS and NFIP Mapping Needs

During FEMA's Flood Map Modernization program from 2003 to 2008, FEMA adhered to Procedure Memorandum No. 56, which states that, "Section 575 of the National Flood Insurance Program Reform Act of 1994 mandates that at least once every five years FEMA assess the need to review and update all floodplain areas and flood risk zones identified, delineated, or established under Section 1360 of the National Flood Insurance Act, as amended." This requirement was fulfilled prior to this Discovery process through the Mapping Needs Assessment process. Other mechanisms such as the Mapping Needs Update Support System and scoping reports were used to capture information describing conditions on the FIRMs and the potential for a map update. FEMA's CNMS was initiated through FEMA's Risk MAP program in 2009.

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 (those with new hydrologic and hydraulic models) performed during the Map Modernization program were automatically determined to be "Valid" and the remaining studies went through a 17 element validation process with 7 critical and 10 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 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 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 (e.g., 10 percent to 15 percent, 20 percent to 30 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: Have significant changes to vegetation or land use 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 input for CNMS community requests and help prioritize studies in the watershed. It is projected that the CNMS geodatabase will eventually be available to the public online.

Table 24: *Current Status of CNMS* shows the status of the counties in this project area prior to the Discovery process.

An informational flyer regarding CNMS can be found [online](#) or by reviewing Attachment 6: *Coordinated Needs Management Strategy* in the digital version of this Discovery Report. More information about CNMS can also be found on [FEMA's CNMS webpage](#) or by viewing an informative PowerPoint presentation on the CNMS process created by the [Illinois State Water Survey](#).

**Table 24: Current Status of CNMS (as of August 2013)**

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

County	FIPS	Stream Mileage			
		Valid	Unverified	Unknown	Total
Genesee	36037	0	0	100.96	100.96
Livingston	36051	0	0	179.29	179.29
Monroe	36055	46.14	92.28	27.02	165.44
Ontario	36069	0	0	100.84	100.84
Wyoming	36121	0	0	58.53	58.53



## *Discovery Meetings - Community Discussion of Needs*

During the WebEx No. 2 sessions held in September 2013, and during the series of in-person meetings held in November 2013, mapping needs were catalogued for each of the participating communities. Each represented community met with facilitators to document areas of recurrent flooding, changes to hydraulic structures, areas of growth, and inaccuracies with the effective FIRMs.

The types of needs can be classified as:

- Unstudied streams in areas of growth and development;
- Maps are old and impossible to read due to scale (several communities have flat fold maps); and
- Need to have established BFEs on large bodies of water.

**Error! Reference source not found.:** *Summary of Community Floodplain Mapping Needs* captures the ongoing discussion of needs that took place during the Discovery Process. This table highlights the communities that participated in the planning, provided information on the Data Worksheets, and noted specific needs related to their effective FIRMs. Data Worksheets were collected following the meeting discussions. Appendix H of this document includes a summary of the discussions in each of the communities that participated in the Discovery meetings and/or submitted Data Worksheets. The CNMS database entries also include larger construction projects that were noted during the meetings with the Lower Genesee Watershed communities during 2013. These findings will be included in the main CNMS database.

## **IV. Discovery Meetings**

A series of conference calls with virtual meeting capabilities was held in August and September 2013 and was followed up with 10 in-person meetings held in November 2013 throughout the Lake Ontario Watershed.

The Lake Ontario Watershed Discovery project is the beginning of an interactive process that will result in a watershed-wide assessment of existing flood hazard mapping needs, existing information useful in updating the FIRMs, and ultimately recommendations for the development of updated Risk MAP and FIRM products.

The purpose of the Discovery meeting is to review any information previously provided by communities, State and regional agencies, and local stakeholders; discuss each community's floodplains 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 E through H include the Discovery meeting preparation and meeting materials:

- Meeting Agenda/Minutes (Appendix E: *Discovery Meeting Agenda*)
- Meeting Sign-In sheet (Appendix F: *Discovery Meeting Sign-In Sheet*)
- Meeting Presentations (Appendix G: *Discovery Presentation*)
- Discovery Maps and Stream Matrices (Appendix H: *Discovery Meeting Data Worksheets and Stream Matrices*)

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

## Webinars

WebEx No. 1 sessions were held August 13–15, 2013. These meetings were held via WebEx/conference call. This first WebEx was to introduce the planning team; request feedback from the municipalities, counties, and regional groups within the project area; and to determine what additional local floodplain and hazard risk data were available and who should be included in the process. Representatives from Cayuga, Genesee, Herkimer, Jefferson, Lewis, Monroe, Niagara, Onondaga, Ontario, Oswego, St. Lawrence, and Wayne Counties; USACE; the Nature Conservancy; and Regional Planning Commissions attended.

The participants were asked if there were additional stakeholders that should be added to the list. Several participants suggested the Cooperative Extensions and Soil and Water Conservation District (SWCD) in each county be invited. It was also suggested the following stakeholders be added to the distribution lists:

- Onondaga Planning and Environmental Health
- Finger Lakes Protection Alliance
- Northern Oneida County Council of Governments
- Black Creek Watershed Coalition
- Cayuga Creek Watershed Coalition

Meeting presentation materials are available at <https://www.rampp-team.com/documents/newyork/Discovery Kickoff Meeting Lake Ontario Watershed 2013.pdf>

WebEx No. 2 sessions were held September 17–20, 2013. These seven meetings were held via WebEx/conference call. This second WebEx was to request feedback from the municipalities, counties, and regional groups within the project area, and to determine what additional local floodplain and hazard risk data were available and should be included in the process.

The second half of the meeting was interactive, with community maps shown on the meeting screen and participants discussing floodplain mapping needs within their communities. Floodplain mapping needs and areas of concern included: areas that experience flooding, locations of bridge/culvert replacements, areas where FEMA maps are inaccurate or do not exist. To further expand on this discussion, participants were asked to complete and return the Data Worksheets to supplement the interactive discussion.

Attendees included representatives from Cayuga, Genesee, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Monroe, Niagara, Onondaga, Ontario, Orleans, Oswego, St. Lawrence, Wayne, and Wyoming Counties; USACE; the Nature Conservancy; SWCDs; and Regional Planning Commissions.

## In-Person Meetings

In-person meetings are to facilitate discussion about study needs, mitigation project needs, desired compliance support, and local flood risk awareness efforts. Attendees, including all affected communities and other selected stakeholders, were asked to cooperatively identify areas of concern within their watershed. **Error! Reference source not found.: Community Meeting**

*Information* includes meeting dates and locations for the 10 in-person meetings held during Discovery.

**Table 25: Community Meeting Information**

Date and Time	Communities	Meeting Location
Tuesday November 12, 2013 2:00 PM	Wayne and Cayuga Counties	Wayne County Public Safety Building Operations Room 7376 Route 31 Lyons, NY
Wednesday November 13, 2013 9:00 AM	Oswego and Onondaga Counties	County office Building Legislative Chamber 46 East Bridge Street Oswego, NY
Wednesday November 13, 2013 2:30 PM	Lewis, Hamilton, Herkimer, and Oneida Counties	Cornell Cooperative Extension 5274 Outer Stowe Street Lowville, NY
Thursday November 14, 2013 9:30 AM	Jefferson County Coastal Communities and St. Lawrence County	Cornell Cooperative Extension West Room 203 North Hamilton Street Watertown, NY
Thursday November 14, 2013 2:00 PM	Jefferson County Inland Communities	Cornell Cooperative Extension West Room 203 North Hamilton Street Watertown, NY
Tuesday November 19, 2013 9:30 AM	Monroe County	Monroe County Emergency Management Building Rooms 117A and 117B 1190 Scottsville Road Rochester, NY
Tuesday November 19, 2013 2:00 PM	Orleans County	Cornell Cooperative Extension 12690 Route 31 Albion, NY
Wednesday November 20, 2013 9:30 AM	Niagara County	Cornell Cooperative Extension 4487 Lake Avenue Lockport, NY
Wednesday November 20, 2013 2:30 PM	Genesee and Wyoming Counties	Batavia Town Hall 3833 West Main Street Road Batavia, NY
Thursday November 21, 2013 9:30 AM	Livingston and Ontario Counties	Emergency Operations Center 3360 Gypsy Lane Mount Morris, NY

For the Lower Genesee Watershed, the in-person meeting(s) were held on Tuesday November 19, 2013, at 9:30AM, Wednesday November 20, 2013, at 2:30PM, and Thursday November 21, 2013, at 9:30AM. In addition, representatives of FEMA, various State agencies, county officials, and several non-governmental organizations attended these sessions. Communities represented at the in-person meetings included:

- Genesee County
- Batavia, City of
- Batavia, Town of
- Bergen, Town of

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

- Bergen, Village of
- Byron, Town of
- Livingston County
- Geneseo, Town of
- Geneseo, Village of
- Leicester, Town of
- Leicester, Village of
- Lima, Town of
- Lima, Village of
- Springwater, Town of
- York, Town of
- Monroe County
- Brighton, Town of
- Chili, Town of
- Churchville, Village of
- Gates, Town of
- Henrietta, Town of
- Irondequoit, Town of
- Riga, Town of
- Rochester, City of
- Rush, Town of
- Scottsville, Village of
- Sweden, Town of
- Wheatland, Town of
- Ontario County
- Richmond, Town of
- Middlebury, Town of

A copy of the sign-in sheets for these meetings is available along with the agenda in the appendices.

A PowerPoint presentation was delivered at the start of the meetings. The presentation is located in Appendix G: *Discovery Presentation*. The second half of the meeting was interactive and included breakout sessions during which community officials and stakeholders met with representatives from FEMA, NYSDEC, and RAMPP to discuss the following:

- What are areas of recent or planned development or high growth or other significant land changes?
- What other flood risks are there?
- What other mitigation plans and projects are there?
- What are your community's concerns?
- How can we (both FEMA and you) communicate risk within your community and increase resilience from floods?

## Discovery Process Outcomes

**Error! Reference source not found.:** *Summary of Community Floodplain Mapping Needs* captures the ongoing discussion of needs that took place during the Discovery process via Data Worksheets, virtual meetings, community contacts, and the in-person meetings. This table highlights the communities that participated in the planning, provided information on the Data Worksheets, and noted specific needs related to their effective FIRMs. Appendix H of this document includes a summary of the discussions in each of the communities that participated in the Discovery meetings and/or submitted Data Worksheets.

All communities have noted hydraulic changes due to bridge and culvert replacements since the effective maps. Twenty-seven of the 56 communities within the study area attended the in-person meetings.

Monroe County communities have digital FIRMs; however, several communities have noted hydraulic changes since the digital products were prepared, such as the City of Rochester and

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

Towns of Gates, Henrietta, Ogden, and Wheatland, and the Village of Scottsville. Monroe County has also noted concerns with the digital products due to LiDAR accuracy. Several communities within the county have requested stream reaches to be restudied and updated to include BFEs. Extents of these needs have been captured in the CNMS database.

Genesee, Livingston, Ontario, and Wyoming Counties do not have digital countywide floodplain products. The Town of Sparta in Livingston County has a digital FIRM, but all other communities have paper FIRMs. The current paper FIRMs are not usable for interpretation and determinations. At a minimum, digital products would assist the communities with their floodplain management.

Genesee County communities noted many bridge and culvert replacements. Requests for studies within Genesee County came from the City of Batavia for Tonawanda Creek, the Town of Batavia for Tonawanda Creek Reaches 1 and 2 and Spring Creek, the Village of Bergen for Minny Creek, and the Town of Byron for Spring Creek.

Requests for studies in Livingston County came from the Town and Village of Geneseo for Jaycox Creek; the Town of Geneseo for Conesus Lake and the tributaries to Conesus Creek; the Town of Leicester for the Genesee River and Beards Creek and its tributaries; the Village of Leicester for Beards Creek; the Town of Lima for Honeoye Creek; the Village of Lima for Spring Brook; the Town of Springwater for Springwater Creek, Hemlock Creek, and Limekiln Creek; and the Town of York for Bidwells Creek, Browns Creek, and Fowler Creek and its tributary. Livingston County also requested numerous streams be studied.

Ontario County communities also noted many bridge and culvert replacements. The Town of Naples requested restudies for Grimes Creek and Naples Creek, and the Town of Richmond requested restudies for all streams within the Town.

Wyoming County CNMS needs were captured for the Towns of Middlebury and Warsaw and the Village of Wyoming and focused on Oatka Creek.

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Genesee	Batavia, City of	9/16/1982	Yes	Paper	Yes	No	Yes	Yes	Yes	<p>- Tonawanda Creek needs a detailed study due to flooding that occurs at the intersection of Walnut and Law and south of Railroad to the corporate limits and Lehigh Street.</p> <p>- Hydrology and hydraulic studies are available for the Main Street reconstruction in 2002.</p>
	Batavia, Town of	1/17/1985	Yes	Paper	Yes	No	No	Yes	Yes	<p>- Tonawanda Creek Reach 2 needs a new limited detailed study from the corporate limit with Alexander to the corporate limit with the City of Batavia due to new development in this area. The current floodplain extent is too wide and does not take into account the effects of wetland storage.</p> <p>- Tonawanda Creek Reach 1 needs an updated detailed study from the western corporate limit of the Town to the western corporate limit of the City due to ice jam related flooding that is not reflected in the effective riverine analysis.</p> <p>- Spring Creek needs a new limited detailed study. There is currently an approximate study for this stream that is affecting development in this area of the Town.</p>

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Genesee (cont'd)	Batavia, Town of (cont'd)	1/17/1985	Yes	Paper	Yes	No	No	Yes	Yes	<ul style="list-style-type: none"> <li>- All approximate studies should be updated to new approximate studies due to outdated methods and they do not reflect an engineering based analysis.</li> <li>- There is new development southeast of the City of Batavia where the current flood maps indicate flooding that is too wide.</li> <li>- There have been culvert/bridge replacements in the Town since the last map updates.</li> <li>- The H&amp;H near the water treatment plant is not accurate. There is currently a jump in the BFE.</li> <li>- Ice jams, debris, and erosion have occurred along Tonawanda Creek.</li> </ul>
	Bergen, Town of	7/6/1984	Yes	Paper	Yes	Yes	No	No	Yes	<ul style="list-style-type: none"> <li>- None requested by the Town. However, there have been numerous culvert replacements in the Town.</li> <li>- The Town experiences standing water when the wells are not operational.</li> <li>- There has been commercial development within the Town.</li> </ul>



**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Genesee (cont'd)	Bergen, Village of	6/8/1979	Yes	Paper	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- The Unnamed Tributary to Black Creek (known locally as Minny Creek) needs a new detailed study due to minor repeat flooding experienced on Gibson Street in the wetland area. An updated study would also help the Village with grant applications. A portion of this stream has also been piped.</li> <li>- There have been culvert replacement within the Village since the last map update.</li> </ul>
	Bethany, Town of	9/2/1984	Yes	Paper	No	No	No	No	No	- No needs provided
	Byron, Town of	2/1/1988	No	Paper	Yes	No	No	No	Yes	<ul style="list-style-type: none"> <li>- There have been culvert/bridge replacements within the Town since the last map update.</li> <li>- The tributaries to Black Creek need to be studied by approximate methods. The current studies end at the Town of Elba town line.</li> <li>- Spring Creek needs an approximate study. The creek is studied by approximate methods in the Town of Elba, but the study ends at the western corporate limit of the Town of Byron. The Town would benefit from having the study continued from the western corporate limit to the confluence with Black Creek.</li> </ul>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Genesee (cont'd)	Byron, Town of (Cont'd)	2/1/1988	No	Paper	Yes	No	No	No	Yes	<ul style="list-style-type: none"> <li>- The Unnamed Tributaries to Spring Creek need approximate studies from the western corporate limits of Byron to the confluences with Spring Creek. These tributaries are studied by approximate methods in the Town of Elba and the Town of Byron would like these studies continued from Elba into Byron.</li> <li>- The Town would benefit from digital maps and updated stream mapping.</li> </ul>
	Elba, Town of	10/5/1984	No	Paper	No data gathered from Community due to lack of participation.					
	Le Roy, Town of	9/14/1979	No	Paper	Yes	No	No	No	No	<ul style="list-style-type: none"> <li>- Mud Creek Tributary needs a limited detailed study from the Village of Le Roy corporate limit to Perry Road due to proposed development in this area.</li> <li>- Oatka Creek needs a detailed study due to sinkholes.</li> <li>- There is an Unnamed Tributary that is studied in detail in Village. The detailed study needs to be continued south into the Town, as this is an area of proposed development.</li> <li>- The Mud Creek study is not continuous. It needs redelineation with new topo and it needs to account for sinkholes along Mud Creek.</li> </ul>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Genesee (cont'd)	Le Roy, Village of	8/3/1981	No	Paper	Yes	No	No	No	No	- Oatka Creek needs to be updated to a detailed study.
	Pavilion, Town of	2/27/1984	No	Paper	No data gathered from Community due to lack of participation.					
	Stafford, Town of	7/16/1982	No	Paper	Yes	No	No	No	No	- Black Creek needs an approximate study from the Thruway in Stafford to the Bethany town line. This section of the Black Creek is currently not mapped.  - White Creek needs an approximate study along the East Bethany LeRoy Road
Livingston	Avon, Town of	8/15/1978	No	Paper	Yes	No	No	No	No	- Conesus Creek needs an approximate study. There is residential development near the creek where it is currently not studied.  - The unnamed stream in the Town of Avon needs an approximate study from north of Sutton Road to East Avon Road.
	Avon, Village of	8/1/1978	No	Paper	No data gathered from Community due to lack of participation.					
	Caledonia, Town of	6/1/1981	No	Paper	No data gathered from Community due to lack of participation.					
	Caledonia, Village of	6/1/1981	No	Paper	No data gathered from Community due to lack of participation.					
	Conesus, Town of	2/15/1991	No	Paper	Yes	No	No	No	No	McMillan Creek and its unnamed tributary need approximate studies from Marshal Road to Route 15.

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Livingston (cont'd)	Conesus, Town of (cont'd)	2/15/1991	No	Paper	Yes	No	No	No	No	<ul style="list-style-type: none"> <li>- An approximate study is needed for the stream north of Conesus Springwater Road and S Livonia Road.</li> <li>- An approximate study is needed for the tributaries to Conesus Creek near South Lima Road, Rochester Road, and Sweetness Blvd.</li> </ul>
	Geneseo, Town of	9/29/1996	Yes	Paper	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- Conesus Lake needs a detailed study. There is redevelopment along the lake front and it would be beneficial to have updated digital maps with a base flood elevation to enforce building standards.</li> <li>- Jaycox Creek should needs a detailed study from the Village of Geneseo corporate limits to Lima Road. There is flooding caused by a change in topography and culvert at Lima Road.</li> <li>- Digital maps would be helpful for community officials.</li> <li>- The unnamed tributaries to Conesus Creek and low lying marsh area in the northeast corner of town need approximate studies. This land is for sale and it may be developed in the near future. Digital approximate studies would be helpful for enforcement of any proposed development.</li> </ul>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Livingston (cont'd)	Geneseo, Town of (cont'd)	9/29/1996	Yes	Paper	Yes	No	Yes	No	Yes	- There is a problematic culvert on the eastern side of the Village where an Unknown Stream flows into the town which needs an approximate study.
	Geneseo, Village of	9/29/1996	Yes	Paper	Yes	No	Yes	No	Yes	- Jaycox Creek needs to be redelineated as a detailed study within the Village due to limited detail in the current base map. Having a digital product would be much more useful for planning and enforcement of development.
	Groveland, Town of	2/15/1991	Yes	Paper	N/A	Yes	No	No	No	None submitted
	Leicester, Town of	1/20/1982	Yes	Paper	Yes	No	No	No	Yes	<p>- The Genesee River needs to be restudied by detailed methods due to a salt mine collapse in 1994, significant erosion along the river banks, and changes to the Town boundary.</p> <p>- The Genesee Green Valley Greenway needs a detailed study due to repeat flooding in the area. This areas is currently not studied.</p> <p>- Beards Creek needs a new approximate study from just south of County Route 39/State Route 29A to the northern corporate limit of the Town. The current study ends before the Town limit.</p> <p>- The detailed study of Beards Creek should be redelineated due to changes in topography around the creek.</p>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Livingston (cont'd)	Leicester, Town of (cont'd)	1/20/1982	Yes	Paper	Yes	No	No	No	Yes	<ul style="list-style-type: none"> <li>- The approximate and detailed studies for the Tributary to Beards Creek should be redelineated.</li> <li>- Little Beards Creek needs to be redelineated due to changes in topography and the need for updated digital mapping.</li> <li>- Tributary No. 1 to Beards Creek needs to be redelineated due to changes in topography and the need for updated digital mapping.</li> <li>- The Town would benefit from updated digital maps and maps that are continuous between Town and Village.</li> </ul>
	Leicester, Village of	8/27/1982	Yes	Paper	Yes	No	No	No	Yes	<ul style="list-style-type: none"> <li>- Beards Creek needs an approximate study for its length within the Village.</li> <li>- The Village would like digital mapping products.</li> </ul>
	Lima, Town of	12/23/1983	Yes	Paper	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- Honeoye Creek needs a new limited detailed study for its entire length though the Town. There is a need for flood elevations and updated base map due to level of development within the Town. There are also spring ice jams near the Route 5 &amp; 20 Bridge.</li> <li>- Spring Brook needs a new limited detailed study for its length along the Village of Lima corporate limits.</li> </ul>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Livingston (cont'd)	Lima, Town of (cont'd)	12/23/1983	Yes	Paper	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- The Town would like digital maps using 2010 Livingston County LiDAR and orthoimagery. The current extent of flooding is not correct.</li> <li>- Area near West Bloomfield and State Routes 5 and 20 needs to be restudied.</li> <li>- There have been culvert/bridge replacements within the Town.</li> </ul>
	Lima, Village of	7/23/1982	Yes	Paper	Yes	No	Yes	No	Yes	<p>Spring Brook needs a new limited detailed study for its length within the Village. The Village needs the correct extent of the floodplain and elevations for administration of new development.</p> <ul style="list-style-type: none"> <li>- The Village would like digital maps using 2010 Livingston County LiDAR and orthoimagery. The current extent of flooding is not correct.</li> <li>- New development is not reflected on the maps. Current FIRM panels are not printed and labeled as Zone C in developed areas.</li> <li>- The current maps are 30 years old, very small scale, and not capable of applying to specific properties.</li> </ul>
	Livonia, Town of	2/19/1992	No	Paper	Yes	No	No	No	No	The tributaries to Conesus Creek and the northern part of Conesus Lake need detailed studies due to areas of dense residential development.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Livingston (cont'd)	Livonia, Village of	6/1/1988	No	Paper	No data	gathered from Community due to lack of participation.				
	Sparta, Town of	4/5/2010	No	Digital	Yes	No	No	No	No	- Conesus Creek needs a detailed study in the Town of Sparta through the Hamlet of Scottsburg.
	Springwater, Town of	8/24/1984	Yes	Paper	Yes	No	Yes	No	Yes	<p>- Springwater Creek needs a detailed study for its length within the Town due a proposed trailer park expansion near the stream. Having a base flood elevation would help with regulating the expansion of the trailer park.</p> <p>- Hemlock Creek needs a detailed study for its length within the Town. There is a trailer park near the stream and base flood elevations would be helpful for enforcement purposes.</p> <p>- Limekiln Creek needs an approximate study. There is little to no development in this area due to agriculture and wetlands along the stream, but an updated digital map would be helpful for community officials.</p> <p>- The Town would benefit from updated digital maps.</p> <p>- There have been bridge and culvert replacements within the Town since the last map update.</p>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Livingston (cont'd)	Springwater, Town of (cont'd)	8/24/1984	Yes	Paper	Yes	No	Yes	No	Yes	- McMillan Creek has experienced frequent flooding along Route 15. This area is currently unmapped.
	York, Town of	1/20/1982	Yes	Paper	Yes	No	No	No	Yes	<p>- Bidwells Creek needs a detailed study from the confluence with Salt Creek to just beyond Main Street. This is a residential area of the Town and there is also a wastewater treatment plant off of Restof Road along the stream.</p> <p>- Browns Creek needs a detailed study from Limerick Road to the confluence with the Genesee River. This is a densely developed residential area in the center of the Town and the current study is outdated.</p> <p>- Fowler Creek needs a detailed study due to structures in the hamlet of Fowlerville that experience flooding. The current detailed study is outdated.</p> <p>- Fowler Creek Tributary needs a detailed study from just south of Anderson Road to the confluence with Fowler Creek. There are a few residential structures and a few large commercial structures near the tributary.</p>

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Livingston (cont'd)	York, Town of (cont'd)	1/20/1982	Yes	Paper	Yes	No	No	No	Yes	<ul style="list-style-type: none"> <li>- The Genesee River needs an updated detailed study due to a salt mine collapse in 1994. This has impacted the topography of the area and changed the floodplain of the river.</li> <li>- Tributaries to the Genesee River should be studied by approximate methods.</li> <li>- The Town would benefit from updated digital maps with BFEs.</li> <li>- There is a High Water Mark on Salt Creek.</li> </ul>
Monroe	Brighton, Town of	8/28/2008	Yes	Digital	Yes	No	No	Yes	Yes	<ul style="list-style-type: none"> <li>- The Town has experienced flood and stormwater issues including flooding on Crittenden Road as well as commercial and residential development.</li> <li>- A stream restoration project has been completed on Buckland Creek.</li> <li>- The West Branch of Allens Creek may have been affected by NYSDOT improvements and a retention pond that are not shown on the current maps.</li> </ul>
	Chili, Town of	8/28/2008	Yes	Digital	N/A	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- The county noted that Black Creek needs a detailed study due to the age of the current study and the frequency of flooding events along the creek.</li> </ul>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Monroe (cont'd)	Churchville, Village of	8/28/2008	Yes	Digital	Yes	No	Yes	Yes	Yes	<ul style="list-style-type: none"> <li>- Black Creek needs a detailed study due to the age of the current study and the frequency of flooding events along the creek.</li> <li>- There have been culvert/bridge replacements within the Village since the last map update.</li> <li>- NYSDEC 2004 scoping notes include the following references to mapping needs: the Unnamed Stream near Parnell Drive should have a detailed study, and the Unnamed Tributary to Black Creek should have an approximate study to the corporate limits.</li> </ul>
	Gates, Town of	8/28/2008	Yes	Digital	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- Little Black Creek needs an updated detailed study due to the number of LOMAs within the creek's floodplain.</li> <li>- Buffalo Creek needs an updated detailed study that continues through the culvert under the ramp to I-490.</li> <li>- Round Creek Pond Reach 2 needs an updated detailed study due to inaccuracies in the floodplain delineation. There is a large section of piped stream near Jennifer Circle.</li> </ul>

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Monroe (cont'd)	Gates, Town of (Cont'd)	8/28/2008	Yes	Digital	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- Long Pond Creek needs an updated detailed study due to inaccuracies in the floodplain delineation. Drawings and dimensions of underground piping were provided on the scoping map. There is also a retention pond on Rahway Road.</li> <li>- Railroad culverts have clogged and need maintenance.</li> <li>- There have been culvert/bridge replacements within the Town since the last map update.</li> </ul>
	Henrietta, Town of	8/28/2008	Yes	Digital	Yes	No	Yes	Yes	Yes	<ul style="list-style-type: none"> <li>- East Stem Middle Branch Red Creek needs an updated detailed study due to LOMAs filed for residential development and commercial development.</li> <li>- Genesee River needs an updated detailed study due to many elevation certificates for an old subdivision and repeated flooding near River Meadow Drive. There is also a very wide floodway that may be over stated.</li> <li>- West Branch Allen Creek needs an updated study due to culvert replacements along Jefferson Road.</li> <li>- There is flooding along Pinnacle Road that may be due to a need for ditch maintenance</li> </ul>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Monroe (cont'd)	Henrietta, Town of (Cont'd)	8/28/2008	Yes	Digital	Yes	No	Yes	Yes	Yes	<ul style="list-style-type: none"> <li>- Several areas of LOMAs are clustered including East Stem Middle Branch Red Creek, East Branch Red Creek, East Branch Tributary Red Creek, and West Stem Branch Red Creek.</li> <li>- There is a Red Creek Watershed report available.</li> <li>- There is ongoing commercial development between West and East Stem Middle Branch Red Creek.</li> </ul>
	Honeoye Falls, Village of	8/28/2008	Yes	Digital	N/A	No	Yes	No	No	None submitted by the Village. However Honeoye Creek has flooded repeatedly in the area of Ontario Street, Hyde Park, and Rittenhouse Drive. Spring ice jams also flood yards and basements of properties bordering the creek.
	Irondequoit, Town of	8/28/2008	Yes	Digital	Yes	No	Yes	Yes	Yes	The County would like new detailed studies for the Lake Ontario shoreline in Irondequoit due to development along the shoreline. There is also a new marina at the mouth of the Genesee River in between Greece and Irondequoit and there is erosion along the Lake Ontario shoreline near Genesee River.
	Mendon, Town of	8/28/2008	Yes	Digital	N/A	No	No	No	No	None noted by the community. NYSDEC 2004 scoping notes include a reference for mapping needs on an unnamed stream that needs a detailed study from Honeoye Creek to the Village limits.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Monroe (cont'd)	Ogden, Town of	8/28/2008	Yes	Digital	Yes	No	No	Yes	No	<ul style="list-style-type: none"> <li>- A detailed study is needed of the tributary to Salmon Creek between Washington Street and South of the New York State Barge Canal. There is currently a flood study available for this area.</li> <li>- The Little Black Creek needs an updated detailed study due to the area experiencing development near Route 33 and Buffalo Road. The floodplain extent may be over stated.</li> <li>- NYSDEC 2004 scoping notes include references to the following mapping needs: detailed studies of Tributary 1 to Black Creek, Northrup Creek, and West Branch Northrup Creek; a restudy of Little Black Creek; a limited detailed study of Tributary 2 to Black Creek; and approximate studies of Larkin Creek, Tributary 1 to Salmon Creek, and Salmon Creek.</li> </ul>
	Riga, Town of	8/28/2008	Yes	Digital	Yes	No	Yes	Yes	Yes	<ul style="list-style-type: none"> <li>- Black Creek should be studied by detailed methods due to the age of the current study and the frequency of flooding events along the creek.</li> <li>- There have been culvert/bridge replacements within the Town since the last map update.</li> </ul>



**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Monroe (cont'd)	Rochester, City of	8/28/2008	Yes	Digital	Yes	No	No	Yes	Yes	<ul style="list-style-type: none"> <li>- The Genesee River needs an updated detailed study due to a floodwall on the west side of the river not mapped as providing protection from the 1-percent-annual-chance flood event. The floodwall has an elevation of 516.7 ft and the BFE at the location is 513 ft. This area was not previously mapped as in the floodplain.</li> <li>- The County would like new detailed studies for the Lake Ontario shoreline in the City of Rochester due to development along the shoreline. There is also a new marina at the mouth of the Genesee River and there is erosion along the Lake Ontario shoreline near the Genesee River</li> <li>- There have been culvert/bridge replacements within the City since the last map update.</li> </ul>
	Rush, Town of	8/28/2008	Yes	Digital	Yes	Yes	Yes	Yes	Yes	<ul style="list-style-type: none"> <li>- The culvert on Route 15 and 251 needs to be replaced.</li> </ul>
	Scottsville, Village of	8/28/2008	Yes	Digital	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- The Mill Race needs a detailed study due to its no longer being used to the same extent it was historically. The volume of water has been reduced, which should result in a narrower floodplain.</li> <li>- There have been bridge/culvert replacements on Mill Race, and Oatka Creek.</li> <li>- There is seasonal flooding along Oatka Creek.</li> </ul>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Monroe (cont'd)	Sweden, Town of	8/28/2008	Yes	Digital	Yes	No	No	No	Yes	- There have been culvert/bridge replacements within the Town since the last map update.
	Wheatland, Town of	8/28/2008	Yes	Digital	Yes	No	Yes	No	Yes	<p>- The Spring Creek Race needs an updated detailed study in Mumford along George Street. The race is no longer in use and the Town is having problems with a LOMA/LOMR in this area.</p> <p>- Mill Race needs a detailed study due to its no longer being used to the same extent it was historically. The volume of water has been reduced, which should result in a narrower floodplain.</p> <p>- Spring Creek Branches 1 – 6 need to be updated. Mill operations are no longer in use.</p> <p>- Oatka Creek needs a detailed study.</p>
Ontario	Canadice, Town of	5/15/1984	No	Paper	No data gathered from Community due to lack of participation.					
	Naples, Town of	6/8/1984	Yes	Paper	Yes	No	No	Yes	No	- Grimes Creek and Naples Creek need to be restudied using the new methods for approximate studies due to the age of the current FIRMs. The effective maps are from 1984 and are difficult to use due to the scale of the map and the lack of detail. There is also repeated flooding of Naples Creek at State Route 245.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Ontario (cont'd)	Naples, Town of (cont'd)	6/8/1984	Yes	Paper	Yes	No	No	Yes	No	<ul style="list-style-type: none"> <li>- There have been bridge/culvert replacements within the Town since the last map update.</li> <li>- Honeoye inlet (and tributaries) need to be updated. They currently have approximate studies and numerous buildings in the flood zone.</li> </ul>
	Richmond, Town of	12/18/1984	Yes	Paper	Yes	No	Yes	No	Yes	<ul style="list-style-type: none"> <li>- All streams need to be restudied due to the age of the current maps and studies. Many changes have been made such as bridge and culvert replacements that have changed the stream hydraulics.</li> <li>- Honeoye Creek and the Tributaries to Honeoye Creek need to be studied by detailed methods.</li> <li>- There have been bridge/culvert replacements within the Town since the last map update.</li> <li>- Honeoye Lake culverts and a water main installation are planned for 2014.</li> <li>- A USACE sediment hydro survey has been completed.</li> <li>- Development has occurred northeast of an unmapped portion of Mill Creek.</li> <li>- Several piped streams are not shown on the effective maps.</li> </ul> <p>Honeoye Lake and its tributaries have experienced development since the floodplains were last identified and experience flooding.</p>

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Ontario (cont'd)	South Bristol, Town of	5/18/1998	Yes	Paper	N/A	No	Yes	No	No	No needs identified by the community. However, the county noted a need for a restudy of Mill Creek which currently has an approximate study and numerous buildings in the flood zone.
	West Bloomfield, Town of	6/1/1978	No	Paper	Yes	No	No	No	No	- There have been culvert/bridge replacements within the Town since the last map update. - The Town needs BFEs along Routes 20 and 64 in order to regulate development.
Wyoming	Covington, Town of	12/23/1983	No	Paper	No data gathered from Community due to lack of participation.					
	Gainesville, Town of	12/23/1983	No	Paper	No data gathered from Community due to lack of participation.					
	Middlebury, Town of	Non-Participating without FIRMs	Yes	N/A	Yes	No	Yes	No	Yes	- The Town of Middlebury needs floodplain maps, since there are currently no FEMA FIRMs for the Town. - Oatka Creek needs a new detailed study for its length within the Town due to extensive annual flooding. - Village Brook needs a new detailed study due to flooding experienced in 1989 that washed out Wass Road.
	Orangeville, Town of	12/23/1983	No	Paper	No data gathered from Community due to lack of participation.					
	Perry, Town of	12/23/1983	No	Paper	No data gathered from Community due to lack of participation.					
	Warsaw, Town of	12/23/1983	Yes	Paper	Yes	No	No	No	No	- Oatka Creek is experiencing residential development and needs a detailed study.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

**Table 26: Summary of Community Floodplain Mapping Needs**

County	Community	FIRM Effective Date	Submitted Data Worksheet and Mapping Needs	Current FIRMs Format (Paper or Digital)	Needs Captured in CNMS Database	Current Maps Accurate for Needs	Request for Training	Attended WebEx	Attended In-Person Meeting	Summary of Needs/ Map Update Justification
Wyoming (cont'd)	Warsaw, Village of	11/18/1981	No	Paper		No data gathered from Community due to lack of participation.				
	Wyoming, Village of	8/3/1981	No	Paper	Yes	No	No	No	No	- Village Brook needs an updated study. - There has been historic flooding along Village Creek and Oatka Creek.

## V. Risk MAP Projects and Needs

FEMA's Risk MAP allows communities to make informed mitigation decisions by providing products and technologies that communicate and visualize risks. Risk MAP also equips communities with the information and tools they need to develop effective mitigation.

### Coastal Studies

Coastal flood hazard analyses and mapping will be performed for some communities along the shoreline of Lake Ontario (Niagara, Orleans, Monroe, Wayne, Cayuga, Oswego, and Jefferson Counties). As part of the coastal analysis, engineering/work map mapping will be produced. This will include flood hazard analysis and work maps. Currently there is no scope of work for FIRM production.

Below is a summary of data that will be collected and analysis that will be performed:

#### 1) Creation of Bathymetric and Topographic Map Data Inventory

Topographic data for the coastal areas to be studied will be used for coastal analysis, floodplain boundary delineation, and/or testing of floodplain boundary standard compliance. The topographic data used will be based on the data collected as part of this Discovery process, and will depend on the date and accuracy of existing topographic data. Only topographic data that are of better quality than that of the original study or effective studies will be used. New topographic and bathymetric LiDAR, orthoimagery, and hyperspectral imagery will be used for the coastal study areas and will replace the existing datasets.

#### 2) Base Map Acquisition

Base map data for all counties, including data collected during this Discovery process as an initial inventory, will be collected and organized. The necessary permissions from the map sources will be obtained to allow FEMA to use and distribute hard-copy and digital map products using the digital base map. Base map data must comply with FEMA's G&S.

#### 3) Coastal Flood Hazard Analysis

Response-based computational approaches outlined in FEMA G&S Appendix D.3, dated May 2012 (FEMA, 2012) will be used to perform coastal flood hazard analysis for the Lake Ontario shoreline and areas subject to coastal flooding. Coastal flood hazard analyses include some but not all of the following components:

- Wave setup;
- Erosion;
- Wave runup;
- Wave overtopping;
- Overland wave propagation; and
- Primary frontal dune identification (where applicable).

A transect-based approach for assessing coastal flood risks along Lake Ontario will be used.

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

The 1.5-foot breaking wave height will be selected from the Wave Height Analysis for Flood Insurance Studies results and used to define the LiMWA as described in FEMA Procedure Memorandum No. 50, updated in 2012.

Coastal flood hazards will be mapped as outlined in FEMA's G&S Appendix D.3, dated May 2012 (FEMA, 2012). Flood hazard mapping will extend to the landward limit of coastal flooding as a result of waves and storm surge, whichever is more restrictive.

Coastal flood maps (or work maps) will be produced for the study area. The work maps will include the 1- and 0.2-percent-annual-chance SFHA, Coastal High Hazard (Zone VE) and Coastal A Zone (Zone AE), BFEs, and LiMWA. Communities will be provided with an opportunity to review the work maps after the coastal modeling is complete and prior to the official preliminary map release and the start of the regulatory review process.

## Mitigation Projects

During the Discovery process, FEMA, NYSDEC, and RAMPP met with the communities and discussed their recent and current mitigation projects. Based on the results of the Lake Ontario coastal study, the communities can determine if their existing projects and programs are adequate or if they would benefit from additional mitigation measures.

Technical assistance is available through Risk MAP to help communities identify, select, and implement activities to support mitigation planning and risk reduction. Activities could include (but are not limited to):

- Advising in the creation of initial HMPs;
- Advising in the update of existing HMPs;
- Training to improve a community's capabilities for reducing risk;
- Assisting in incorporating flood risk datasets and products into potential and effective community legislation, guidance, regulations, procedures, etc.;
- Assisting with creating, acquiring, and incorporating GIS data into potential and effective maps, planning mechanisms, emergency management procedures, etc.; and
- Facilitating the identification of data gaps and interpreting technical data to identify risk reduction deficiencies that should be corrected.

## Compliance

FEMA uses a number of tools to determine a community's compliance with the minimum regulations of the NFIP. Among them are CACs and CAVs. These tools help assess a community's implementation of its floodplain management regulations and identify any deficiencies and/or violations.

## Coastal Special Flood Hazard Areas

The Lake Ontario Coastal Flood Hazard study analysis may result in new SFHAs, which are defined as areas that will be inundated by a flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent-annual-chance flood is also referred to as the base flood or 100-year flood. SFHAs labeled as Zone AE have been studied by detailed methods and show BFEs. SFHAs labeled as Zone VE are along coasts and are subject to

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



additional hazards from storm-induced velocity wave action. BFEs derived from detailed hydraulic analyses are shown within these zones.

The NFIP shows coastal flood hazards in two different zones on its FIRMs:

- Zone VE, where the delineated flood hazard includes wave heights equal to or greater than 3 feet; and
- Zone AE, where the delineated flood hazard includes wave heights less than 3 feet.

These zones were discussed in greater detail during the Discovery meetings, as the updated coastal analysis results may show that these flood risks exist along the Lake Ontario shoreline.

During the Discovery process of this study, stakeholders were provided with information regarding NFIP requirements that are associated with coastal hazard zones, as well as information about new FEMA guidance related to moderate wave action. These topics, including coastal SFHAs, building requirements in VE Zones, and LiMWA are compiled in the following sections and discussed in greater detail.

## **Building Requirements in VE Zones**

The zone designation and the BFE are critical factors in determining which requirements apply to a building and, as a result, how the structure must be built. The minimum requirements for buildings constructed in Zone VE (Coastal High Hazard Areas), as set by FEMA regulations and New York State Building Codes are as follows:

1. The building must be elevated on pile, post, pier, or column foundations;
2. The building must be adequately anchored to the foundation;
3. The building must have the bottom of the lowest horizontal structural member 2 feet above the BFE (New York State higher standard);
4. The building design and method of construction must be certified by a design professional;
5. The area below the BFE must be free of obstructions; and
6. Enclosures must be made of lightweight wood lattice, insect screening, or breakaway walls.

Communities participating in the NFIP that have mapped VE Zones must adopt floodplain management regulations that meet or exceed the minimum NFIP requirements described above.

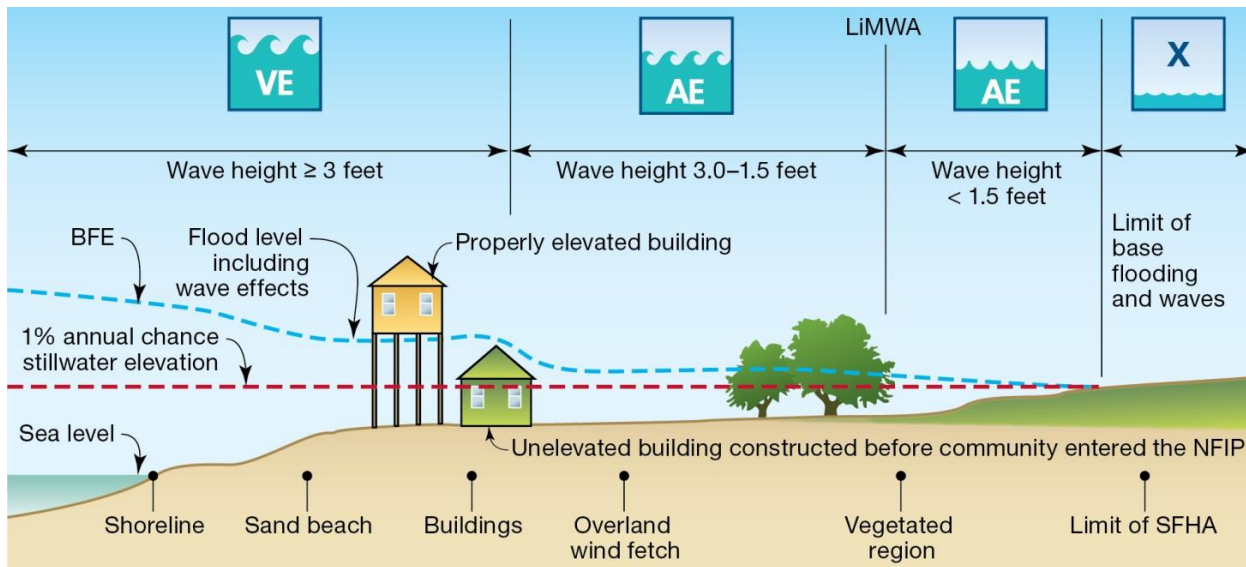
## **Limit of Moderate Wave Action**

Post-storm field investigations and laboratory tests have confirmed that waves as small as 1.5 feet can cause significant damage to structures that are constructed without consideration of coastal hazards. Additional flood hazards associated with coastal waves include floating debris, high velocity flow, erosion, and scour, which can cause damage to Zone AE-type construction in these coastal areas.

To help community officials and property owners recognize this increased potential for damage due to wave action in the AE Zone, FEMA issued Procedure Memorandum 50 in December 2008,

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

as modified by Operating Guidance No. 13-13 Oct. 30, 2013, which provides guidance on identifying and mapping the 1.5-foot wave height line, referred to as the LiMWA. The LiMWA alerts property owners on the lakeward side of this line that although their property is in a Zone AE area, it may also be affected by waves 1.5 feet or higher. Consequently, it is important to be aware of the area between this waterward limit and the Zone VE boundary, as the area may face a high risk—though not as high as Zone VE. Figure 8 explains the LiMWA zone location.



**Figure 8: Limit of Moderate Wave Action**

A new line layer will be added to the FIRM Database to accommodate the LiMWA features. The new layer will be depicted on updated FIRMs as two black dots and three white dashed lines in a sequential pattern. The LiMWA will be identified in the FIRM legend as “Limit of Moderate Wave Action,” and a note will be included in the “Notes to Users” section on the map panel to explain the LiMWA boundary.

Figure 9 is an example FIRM showing the delineated LiMWA. The area in Map A shows the delineation of the LiMWA in an area where the predominant coastal flood hazard is overland wave propagation. Map B shows delineation of the LiMWA in a region where the major coastal flood hazard is wave breaking and runup.

While FEMA does not impose floodplain management requirements based on the LiMWA, the LiMWA is provided to help communicate the higher risk that exists in that area. Because the 1.5-foot breaking wave in the LiMWA zone can potentially cause foundation failure, communities are encouraged to adopt building construction standards similar to those in Zone VE in those areas. For communities that do adopt Zone VE building standards in the area defined by the LiMWA, additional CRS credits are available. CRS credits can lower insurance premiums for residents and business owners. Additional information on CRS can be found online on FEMA’s [CRS webpage](#). Identification of the LiMWA does impact building code requirements. The Building Code of the State of New York references ASCE 24-05 for construction in a coastal high hazard zone.

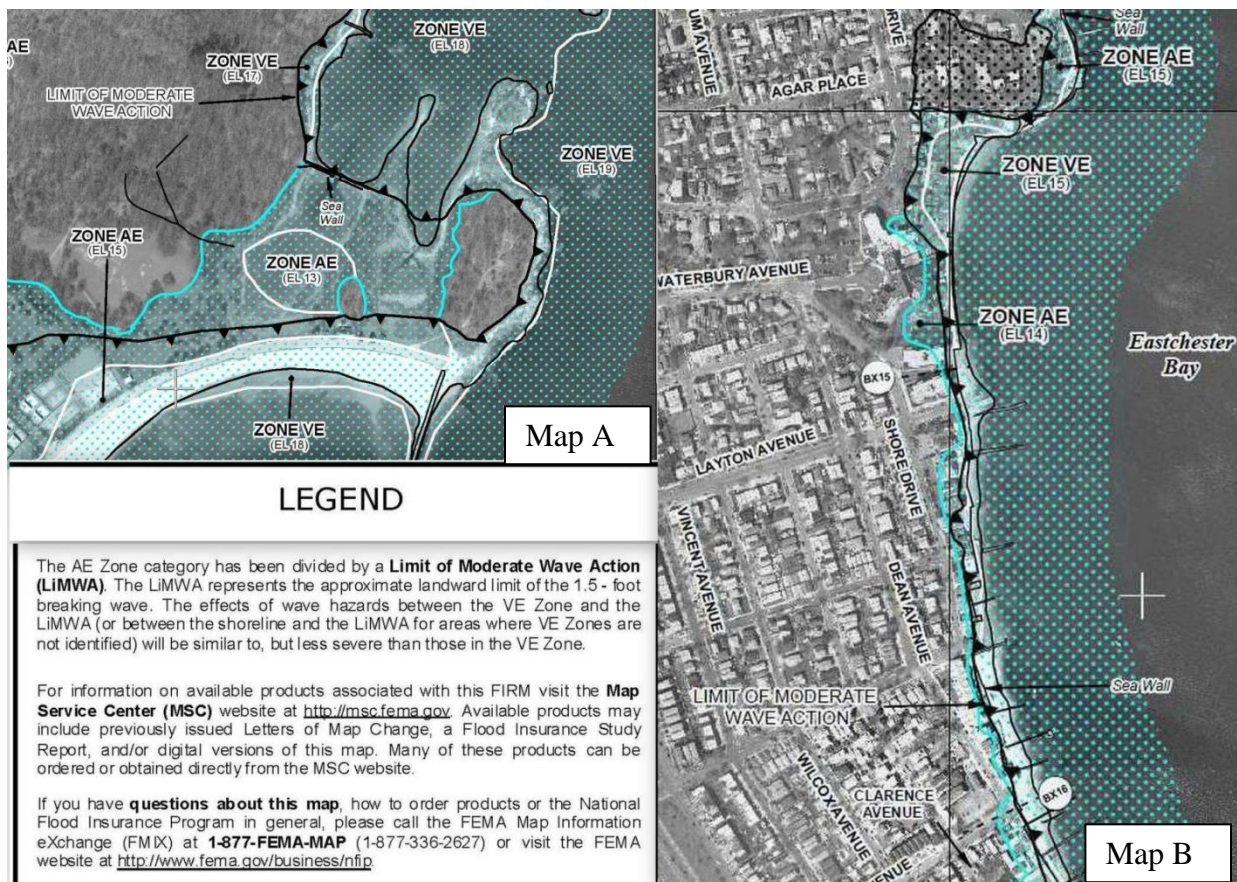
Mapping the LiMWA provides community officials and other stakeholders with additional important flood risk details to consider when buying/developing, mitigating, or enforcing floodplain management regulations in coastal flood hazard areas.

Residents and business owners living or working in the LiMWA zone should be aware of the potential wave action along with floating debris, erosion, and scour that could cause significant damage to their property. They are encouraged to build safer and higher than the minimum local requirements in order to reduce the risk to life and property.

While the risk of damage is higher between the LiMWA line and the Zone VE line than it is in other parts of the coastal AE Zone, NFIP flood insurance rates currently do not differ from other AE Zone rates.

The Federal mandatory purchase requirement does apply in these zones, and property owners are encouraged to carry coverage equivalent to the replacement cost of their building and to include contents coverage.

For additional background information on the LiMWA, please refer to FEMA's [Procedure Memorandum No. 50](#) and [Operating Guidance No. 13-13](#).



**Figure 9: Example FIRM showing LiMWA**

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*



## Communication

Throughout this Discovery process, community representatives and local stakeholders indicated the need to be kept informed about the results of Discovery, the upcoming coastal flood study, and opportunities for public input throughout the study process. As a result of communication to date, several new stakeholders have been identified and added to the master contact database for this study.

## Unmet Needs

The Lake Ontario Discovery process did identify unmet needs. During many discussions with community officials, the need or want of a digital mapping product was raised. Genesee, Livingston, Ontario, and Wyoming Counties do not have digital maps and the information depicted on the maps is not current (location of flooding and roads) with effective studies ranging from 1977 to 1996.

As noted in **Error! Reference source not found.:** *Summary of Community Floodplain Mapping Needs*, municipalities have noted their current flood maps are not accurate. The types of needs catalogued are further summarized in the Section III: *Summary of Data Analysis* subsection on *Coordinated Needs Management Strategy (CNMS) and NFIP Mapping Needs*. At this time, all needs identified have been included in CNMS and this Discovery Report.

## VI. Conclusion

Communities have expressed concern with current mapping accuracy, paper products, and lack of information to make accurate floodplain management determinations. As noted in the Demographics Section of this Report, the watershed's population growth offers local jurisdictions the opportunity for thoughtful floodplain mitigation and management. Continued vigilance must be maintained so that as the economy improves, good building practices continue for communities within the watershed. The quality of the available flood data and lack of digital products makes floodplain management and mitigation problematic.

Livingston County provided the most CNMS requests for the watershed, followed by Monroe County. The majority of the requests are for updated detailed studies based on floodplain delineation errors, lack of detailed data, changes to the hydraulic condition and population changes or growth in the floodplain. Over 41 different stream extents have been included in the CNMS database to FEMA; the Genesee River, Honeoye Creek and Lake, and Oatka Creek are the dominate stream extent needs requested.

Stream extents that have consistently been discussed as priority needs (as shown in Table 26: *Summary of Community Floodplain Mapping Needs*) and warrant updated studies include Oatka Creek, Tonawanda Creek, Spring Creek, Black Creek, Tributaries to Black Creek, Mud Creek, Black River, Conesus Creek, White Creek, Genesee River, Beards Creek, Honeoye Creek, Spring Creek, Hemlock Outlet, Bidwells Creek, Browns Creek, Fowler Creek, Buckland Creek, Allens Creek, Round Pond Creek, Long Pond Creek, East Branch Red Creek, Red Creek, Irondequoit Creek, Eelpot Creek, Naples Creek, Tannery Creek, and Grimes Creek,. See Appendix O: *Lower Genesee Watershed Recommended Scope of Work* for a copy of this document. Summary notes

of the information provided from the Risk MAP Worksheets and the in person Discovery meetings for each watershed can be found in Appendix N: *Watershed Summary Memorandums*.

In general, a particular emphasis on joining the NFIP's CRS program would benefit these and all watershed communities. There seems to be a great deal of misinformation and lack of communication as to what the CRS is; if a community is eligible for membership; and what level of effort is required to make the CRS beneficial for a community. Local communities may wish to consider pooling resources/efforts or work on a countywide-basis to ease the effort of complying with the requirements of joining the CRS program

In addition, the prevalence of smaller developments (often as limited as two building sites) planned across the watershed may be a challenge to effective floodplain management, as these micro-developments can easily slip through regulatory cracks. Local officials need to be aware that the NFIP minimum building standards apply to all construction in the SFHA. The NFIP also has additional reporting regulations for projects consisting of five lots or 50 acres, whichever is smaller (44 CFR 60.3(b)(3)). Information on the NFIP's building requirements in the SFHA can be found in NYSDEC's [Floodplain Construction Requirements in New York State](#).

Representatives from the Towns of Mount Morris, Dansville, Nunda, Bristol, and East Bloomfield attended the meetings and provided needs and concerns. All of the comments received were outside of the Lower Genesee study area, but have been captured in CNMS and provided to NYSDEC for inclusion in other Discovery processes.

## VII. Deliverables

### Communications

*Contacts*

*Stakeholders*

*Notifications/Invitations*

A. *Discovery Meeting Notification via emails (WebEx) and paper copies (in person meetings)*

B. *Meeting Notes distributed via email and through RAMPP website*

### Information Exchange

*Data Questionnaires*

### Discovery Meeting

*Agenda*

*Presentation*

*Sign-In Sheet*

*Discovery Meeting Map and other related Maps\**

*Meeting Minutes*

*Evaluations*

### Discovery Deliverables

*Report*

*Project Area Map*

*Final Discovery Map*

*Tabular Data, including Data Sources and Mapping Needs*

*Geodatabase\**

*CNMS Database Updates*

\*Due to file size, the Discovery meeting maps and CNMS database have not been included in the Discovery report. Maps and data are available through NYSDEC for review upon request.

## VIII. References

Federal Emergency Management Agency. <http://www.fema.gov>.

Federal Emergency Management Agency, Map Service Center. <https://msc.fema.gov/portal>.

Federal Emergency Management Agency, HAZUS flood loss estimation.  
<http://www.fema.gov/HAZUS>.

Federal Emergency Management Agency, Disasters, <http://www.fema.gov/disasters>.

FloodSmart, the official site of the National Flood Insurance Program (NFIP).  
<http://www.FloodSmart.gov>.

National Committee on Levee Safety: <http://www.leveesafety.org/>.

New York State Department of Environmental Conservation: <http://www.dec.ny.gov>.

NFIP Reform: <http://www.fema.gov/bw12>.

Risk Assessment, Mapping and Planning Partners: <http://www.RAMPP-team.com/ny.htm>.

U.S. Census Bureau, 2010, State and County Quick Facts, <http://quickfacts.census.gov>,  
accessed November 2013.

U.S. Fish and Wildlife, Coastal Barrier Resources System. <https://www.fws.gov/ecological-services/habitat-conservation/coastal.html>

USGS National Water Information System: <http://nwis.waterdata.usgs.gov/ny/nwis/peak>.



## IX. Appendices

Due to file size, all appendices have been published as separate accompanying attachment to this report.

Appendix A: Pre-Discovery Mailing List and Invitation Letter  
Appendix B: Pre-Discovery Stakeholder Meetings  
Appendix C: Kickoff Meeting Notes  
Appendix D: Other Stakeholders in the Watershed  
Appendix E: Discovery Meeting Agenda  
Appendix F: Discovery Meeting Sign-In sheets  
Appendix G: Discovery Meeting Presentation  
Appendix H: Discovery Meeting Data Worksheets and Stream Matrices  
Appendix I: Community Acknowledgement Letters  
Appendix J: Community Ordinances  
Appendix K: FEMA Hazus-MH Average Annualized Loss (AAL)  
Appendix L: Dams and Floodplain Structures  
Appendix M: FEMA Public Assistance Funding  
Appendix N: Watershed Summary Memorandums  
Appendix O: Watershed Recommended Scope of Work

## X. Attachments

### Attachment 1: Substantial Improvement/Substantial Damage Desk Reference, FEMA Publication

When buildings undergo repair or improvement, it is an opportunity for local floodplain management programs to reduce flood damage to existing structures. More than 21,000 communities participate in the National Flood Insurance Program (NFIP), which is managed by the Federal Emergency Management Agency (FEMA). To participate in the NFIP, communities must adopt and enforce regulations and codes that apply to new development in Special Flood Hazard Areas (SFHAs). Local floodplain management regulations and codes contain minimum NFIP requirements that apply not only to new structures, but also to existing structures which are “substantially improved (SI)” or “substantially damaged (SD).”

Enforcing the SI/SD requirements is a very important part of a community’s floodplain management responsibilities. There are many factors that local officials will need to consider and several scenarios they may encounter while implementing the SI/SD requirements. This Desk Reference provides practical guidance and suggested procedures to implement the NFIP requirements for SI/SD.

The Desk Reference provides guidance on the minimum requirements of the NFIP regulations. State or locally-adopted requirements that are more restrictive take precedence (often referred to as “exceeding the NFIP minimums” or “higher standards”).

The [Substantial Improvement/Substantial Damage Desk Reference](#) can be found online on FEMA’s website.

## Attachment 2: Floodplain Construction Requirements in New York State, NYSDEC Information Sheet



# Floodplain Construction Requirements in New York State



*Second in a series of two brochures about the National Flood Insurance Program. The first is entitled Common Questions and Answers about Flood Insurance in New York State.*

## New York State Department of Environmental Conservation

Division of Water  
Bureau of Flood  
Protection and  
Dam Safety

625 Broadway  
Albany, NY 12233-3504  
Phone: (518) 402-8185  
Fax: (518) 402-8082  
dowinfo@gw.dec.state.ny.us

*This brochure discusses basic standards governing construction in floodplains mapped under the National Flood Insurance Program in New York State.*

### Introduction

Floods occur when runoff from rain or snowmelt exceeds the capacity of rivers, stream channels or lakes and overflows onto adjacent land. Floods can also be caused by storm surges and waves that inundate areas along tidal or Great Lakes coastlines. Throughout history, floods have claimed uncounted human lives and devastated property, even destroying cities. Yet people continue to settle and build in floodplains, increasing the risk of property damage and loss of life.

### What is a floodplain?

Floodplains are low-lying lands next to rivers and streams. When left in a natural state, floodplain systems store and dissipate floods without adverse impacts on humans, buildings, roads and other infrastructure. Natural floodplains add to our quality of life by providing open space, habitat for wildlife, fertile land for agriculture, and opportunities for fishing, hiking and biking.

Floodplains can be viewed as a type of natural infrastructure that can provide a safety zone between people and the damaging waters of a flood. But more and more buildings, roads, and parking lots are being built where forests and meadows used to be, which decreases the land's natural ability to store and absorb water. Coupled with changing weather patterns, this construction can make floods more severe and increase everyone's chance of being flooded.

### What is the National Flood Insurance Program?

The National Flood Insurance Program is a federal program created in 1968 to provide flood insurance to people who live in areas with the greatest risk of flooding, called Special Flood Hazard Areas. The program provides an alternative to disaster assistance and reduces the escalating costs of repairing damage to buildings and their contents caused by floods. The program provides flood insurance, while at the same time encouraging the sensible management and use of floodplains to reduce flood damage.

The National Flood Insurance Program offers flood insurance to homeowners, renters and business owners, provided their communities use the program's strategies for reducing flood risk, including adopting and enforcing floodplain

Page 1

management ordinances to reduce future flood damage. Community participation in the National Flood Insurance Program is voluntary. However, flood insurance and many kinds of federal disaster assistance are not available in communities that do not participate in the program. Fortunately, in New York, 1,466 communities participate in the National Flood Insurance Program.

Each participating community has a local law for flood damage prevention that contains specific standards for any development in federally mapped Special Flood Hazard Areas. These areas have a one percent or greater chance of experiencing a flood in any year and are shown on Flood Insurance Rate Maps provided by the Federal Emergency Management Agency (FEMA).

### ***Construction Questions***

All communities that participate in the National Flood Insurance Program have a local law or ordinance that regulates development within mapped floodplains. The basic standards are contained below. However, anybody who wishes to develop any area within a floodplain should consult with their local floodplain manager, often a building inspector or zoning officer, for specific requirements.

**Q. What areas are subject to construction regulations?**

- A.** All development within Special Flood Hazard Areas is subject to floodplain development regulations. The Special Flood Hazard Area is the area that would be inundated by the 100-year flood, better thought of as an area that has a one percent *or greater* chance of experiencing a flood in any single year. Special Flood Hazard Areas are shown on federal flood maps, known as Flood Insurance Rate Maps, as shaded areas labeled with the letter "A" or "V" sometimes followed by a number or letter.
- "V" zones are coastal flood hazard zones subject to wave runup in addition to storm surge.
  - "A" zones include all other special flood hazard areas.
  - "VE" zones, "AE" zones, "V" zones, or "A" zones followed by a number are areas with specific flood elevations, known as Base Flood Elevations.
  - A zone with the letter "A" or "V" by itself is an approximately studied flood hazard area without a specific flood elevation.
  - Within an "AE" zone or a numbered "A" zone, there may be an area known as the "regulatory floodway," which is the channel of a river and adjacent land areas which must be reserved to discharge the 100-year flood without causing a rise in flood elevations.

The floodway is shown either on the community's Flood Insurance Rate Map or on a separate "Flood Boundary and Floodway" map for maps published before about 1988. Within regulatory floodways, more stringent development controls exist than elsewhere in the Special Flood Hazard Area.

**Q. What is the "base flood elevation?"**

- A.** It is the elevation that the one hundred-year flood, better thought of as the flood that has a one percent or greater chance of occurring in any given year, rises to. It is the basic standard for floodplain development, used to determine the required elevation of the lowest floor of any new or substantially improved structure.

**Q. What type of development is subject to construction regulations?**

- A.** All development, including buildings and other structures, mining, dredging, filling, paving, excavation, drilling, or storage of equipment or materials is subject to construction regulations if it occurs within a Special Flood Hazard Area.



- Q. Who regulates development in a Special Flood Hazard Area?**  
**A.** In New York State, local communities that participate in the National Flood Insurance Program regulate development in Special Flood Hazard Areas. An exception is development funded and undertaken by the state or federal government, which is regulated by the responsible agency, subject to technical assistance by the New York State Department of Environmental Conservation and the Federal Emergency Management Agency. Nearly all New York communities participate in the National Flood Insurance Program. A community is defined as a town, city or village. Each participating community in the state has a designated floodplain administrator. This is usually the building inspector or code enforcement official.
- Q. Who must get local floodplain development permits?**  
**A.** Private development is subject to local floodplain development permits. In addition, New York State Environmental Conservation Law states that local laws or ordinances passed to qualify for participation in the National Flood Insurance Program shall apply to any development undertaken within the community by any *county, city, town, village, school district or public improvement district*.
- Q. When is a structure covered by floodplain development regulations?**  
**A.** Any new structure or structure that is substantially improved or substantially damaged by any cause is subject to floodplain development regulations. Substantial improvement or damage occurs when the improvement or the value of the damage exceeds 50% of the market value of the structure.
- Q. What are the standard development requirements within a coastal “V” zone?**  
**A.** New construction and substantial improvement or substantially damaged structures must be elevated on pilings, columns or sheer walls such that the bottom of the lowest horizontal structural member supporting the lowest elevated floor is elevated to or above the base flood elevation (plus two feet beginning in 2007). Detailed standards exist regarding how to elevate the structure.
- Q. What are the standard development requirements within an “A” zone?**  
**A.** When there is a base flood elevation available, the lowest floor *including any basement*, must be at or above the base flood elevation (plus two feet beginning in 2007). Elevation may be by means of properly compacted fill, a solid slab foundation, or a “crawl space” foundation which contains permanent openings to let flood waters in and out. Non-residential structures may be flood proofed in lieu of elevation.
- Q. What if there is no base flood elevation?**  
**A.** In most New York communities, new structures must have the lowest floor three feet or more above the highest adjacent grade. Where a local floodplain administrator has information to estimate a base flood elevation, such as historic flood records or a hydraulic study, that elevation must be used. If the development consists of more than 5 acres or more than 50 lots, the permit applicant must develop a base flood elevation and build accordingly.
- Q. What about a building’s utilities?**  
**A.** Machinery and equipment servicing a building must be elevated to or above the base flood elevation.
- Q. What are the requirements within a regulatory floodway?**  
**A.** No development is allowed unless the developer has first proven that the development will not increase flood elevations at any location during the 100-year flood.

**Q. May a local community pass more restrictive standards?**

**A.** Yes. In fact, local communities are encouraged to provide an extra margin of safety by requiring structures to be elevated above the base flood elevation. Always check with your local community to find out what their standards are.

**Q. How does building elevation effect flood insurance?**

**A.** Flood insurance for a house built two or more feet above the base flood elevation will cost about half as much as for a house built to the base flood elevation. Flood insurance for a house built just one foot below the base flood elevation will cost about four times more than for a house built to the base flood elevation. This additional cost could mean tens of thousands of dollars over the life of a 30-year mortgage.

**Q. Where can I get more information?**

**A.** The New York State Department of Environmental Conservation (DEC) is the state's National Flood Insurance Program coordinating agency. Local officials, developers, and the public may contact the DEC for technical assistance and guidance in all matters associated with the National Flood Insurance Program.

Contact the DEC at the following numbers:

**Central Office:** 518-402-8285

**Region 1:** 631-444-0423

**Region 2:** 718-482-4946

**Region 3:** 845-256-3020

**Region 4:** 518-357-2379

**Region 5 North:** 518-897-1243

**Region 5 South:** 518-623-1221

**Region 6:** 315-793-2358

**Region 7 North:** 315-426-7501

**Region 7 South:** 607-775-2545 x121

**Region 8 North:** 585-226-5446

**Region 8 South:** 607-739-0809

**Region 9:** 716-851-7070





### Attachment 3: *Levee Certification vs. Accreditation,* FEMA Fact Sheet



FEMA



# Levee Certification vs. Accreditation

## What is Levee Certification?

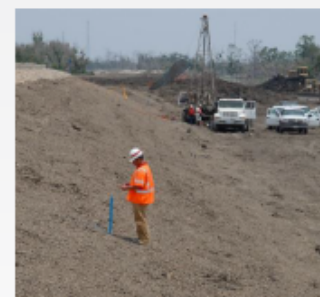
Levee certification is the process that deals specifically with the design and physical condition of the levee, and is the responsibility of the levee owner or community in charge of the levee's operations and maintenance. Certification must be completed for the levee to be eligible for accreditation by the Federal Emergency Management Agency (FEMA). Certification consists of documentation, signed and sealed by a registered Professional Engineer, as defined in Chapter 44 of the Code of Federal Regulations (44 CFR), Section 65.2. This documentation must state the following:

- The levee meets the requirements of 44 CFR, Section 65.10
- The data is accurate to the best of the certifier's knowledge
- The analyses are performed correctly and in accordance with sound engineering practices

This documentation is provided to FEMA to demonstrate that a registered Professional Engineer certified the levee, and meets the specific criteria and standards to provide risk reduction from at least the one-percent-annual-chance flood. Once the levee meets the other requirements of 44 CFR 65.10, FEMA can accredit the levee and show the area behind it as being a moderate-risk area on a Flood Insurance Rate Map (FIRM). If a community or levee owner wants the area behind a levee to be shown as reducing risk from the one-percent-annual-chance flood, they must first complete the process for having the levee certified.

## How is a Levee Certified?

To certify a levee, the community or levee owner must work with a licensed engineer or a Federal agency responsible for levee design to develop and certify documentation that the levee meets design construction standards for at least the one-percent-annual-chance flood. *Levee certification does not warrant or guarantee performance*, and it is the responsibility of the levee owner to ensure the levee is being maintained and operated properly.



## Levees

FEMA defines a levee 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 a level of protection from temporary flooding."

Levees reduce the risk of flooding, but do not eliminate all flood risk. As levees age, their ability to reduce this risk can change and regular maintenance is required to retain this critical ability. In serious flood events, levees can fail or be overtopped and, when this happens, the flooding that follows can be catastrophic.

**RiskMAP**  
Increasing Resilience Together

August 2011

[www.fema.gov/plan/prevent/fhm/rm\\_main.shtml](http://www.fema.gov/plan/prevent/fhm/rm_main.shtml) • 1-877-FEMA MAP

## What is Accreditation?

A levee cannot be accredited until the certification process is completed. FEMA accredits a levee as providing adequate risk reduction on the FIRM if the certification and adopted operation and maintenance plan provided by the levee owner are confirmed to be adequate. An operations and maintenance plan specifies key operating parameters and limits, maintenance procedures and schedules, and documentation methods. FEMA's accreditation is not a health and safety standard—it only affects insurance and building requirements.

An area impacted by an accredited levee is shown as a moderate-risk area, and is labeled Zone X (shaded) on a FIRM. In this case, the National Flood Insurance Program (NFIP) floodplain management regulations do not have a mandatory flood insurance purchase requirement. However, FEMA recommends the purchase of flood insurance due to the risk of flooding from potential levee failure or overtopping.

If the levee is not accredited, the area will be mapped as a high-risk area, known as a Special Flood Hazard Area, or SFHA. In this case, the NFIP floodplain management regulations must be enforced and the federal mandatory purchase of flood insurance applies.

## FEMA's Role

FEMA does not own, operate, maintain, inspect, or certify levees. FEMA's role is limited to identifying and mapping the level of flood risk associated with levees and only accredits them where data showing compliance with 44 CFR 65.10 is provided by the community, levee owner, or other interested parties. FEMA has a responsibility to the public to identify the risks associated with levees that are either not certified or no longer compliant with 44 CFR 65.10. Areas behind non-accredited levees will be shown on FIRMs as a high-risk floodplain.

## What is a Provisionally Accredited Levee or PAL?

FEMA created the PAL designation to facilitate the certification and accreditation process for communities unable to readily provide certification documents, but who reasonably expect levees in the community to provide one-percent-annual-chance flood risk reduction. A PAL is a designation for a levee that FEMA previously accredited on an effective FIRM, and is now awaiting certified data and/or documentation to show the levee remains compliant with NFIP regulations. Levees with structural deficiencies are not eligible for the PAL designation. However, a PAL may include a 12-month period for the correction of maintenance deficiencies.

A community or levee owner's failure to provide full documentation of the status of a levee does not mean the levee doesn't provide the designated level of risk reduction.

However, it does impact how the levee will be mapped on a FIRM because it will be de-accredited, and the impacted area will be mapped as an SFHA.

Before FEMA will apply the PAL designation to a levee, the community or levee owner must sign and return an agreement that indicates the data and documentation required for accreditation will be provided within 24 months or less. The procedures for PALs are clarified and documented in

FEMA Procedure Memorandum No. 43, *Guidelines for Identifying Provisionally Accredited Levees*.



## For More Information

Living with levees is a shared responsibility. It is important for both levee owners and those who live and work near levees to understand the risk associated with levees. FEMA has a number of resources available for further information about levees, including the certification and accreditation process. Below are links to additional information:

- A levee-specific webpage has been set up on the FEMA.gov Web site. Please visit <http://www.fema.gov/levees> for additional information on levees.
- For additional information on levees, please visit: [www.fema.gov/plan/prevent/fhm/lv\\_intro.shtm](http://www.fema.gov/plan/prevent/fhm/lv_intro.shtm).
- For additional information on NFIP criteria for accrediting levees, visit: [www.fema.gov/library/viewRecord.do?id=2517](http://www.fema.gov/library/viewRecord.do?id=2517).
- For more background on Provisionally Accredited Levees, download the fact sheet at: [www.fema.gov/library/viewRecord.do?id=1987](http://www.fema.gov/library/viewRecord.do?id=1987).
- For more specific information regarding levee construction and restoration, visit: [www.fema.gov/plan/prevent/fhm/lv\\_conres.shtm](http://www.fema.gov/plan/prevent/fhm/lv_conres.shtm).
- For additional information on Procedure Memorandums visit: [www.fema.gov/plan/prevent/fhm/gs\\_memos.shtm](http://www.fema.gov/plan/prevent/fhm/gs_memos.shtm).

**RiskMAP**  
Increasing Resilience Together

## Attachment 4: *LOMA-LOMR-F*, FEMA Fact Sheet



## How to Request a Letter of Map Amendment (LOMA) or Letter of Map Revision Based on Fill (LOMR-F)

### SOURCES OF INFORMATION

For general information, interested parties can contact the FEMA Map Information eXchange at, either by telephone, toll free, at 1-877-FEMA MAP (1-877-336-2627), or by e-mail via the FEMA website at [www.fema.gov/plan/prevent/fhm/fmc\\_main.shtm](http://www.fema.gov/plan/prevent/fhm/fmc_main.shtm).

The forms and other documents referenced in this flier are also available from the "Forms, Documents, and Software" portion of the FEMA website at [www.fema.gov/plan/prevent/fhm/fmc\\_main.shtm](http://www.fema.gov/plan/prevent/fhm/fmc_main.shtm).

For copies of effective National Flood Insurance Program maps and reports, interested parties can contact the FEMA Map Service Center, either by telephone, toll free, at 1-877-FEMA MAP, or via the FEMA website at [www.msc.fema.gov](http://www.msc.fema.gov).



### WHAT IS A LOMA OR A LOMR-F?

The Federal Emergency Management Agency (FEMA) applies rigorous standards to develop Flood Insurance Rate Maps (FIRMs) and uses the most accurate hazard information available. However, limitations in the scale or topographic detail of the source maps used to prepare a FIRM may cause small elevated areas to be included in a 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.

To change the flood hazard designation for properties in these areas, FEMA has established the LOMA process for properties on natural high ground and the LOMR-F process for properties elevated by the placement of fill. LOMAs and LOMR-Fs are letter determinations that officially amend an effective FIRM. They can establish that a property is not in an SFHA and, by doing so, remove the Federal flood insurance requirement.

### OBTAINING A LOMA OR LOMR-F

A LOMA application form can be downloaded from the FEMA website at [www.fema.gov/plan/prevent/fhm/dl\\_mt-ez.shtm](http://www.fema.gov/plan/prevent/fhm/dl_mt-ez.shtm). FEMA does not charge a fee to review a LOMA request, but requesters are responsible for providing the required mapping and survey information specific to their property. For FEMA to remove a structure from the SFHA through the LOMA process, Federal regulations require the Lowest Adjacent Grade (LAG) elevation, the lowest ground touching the structure, to be at or above the Base Flood Elevation (BFE). The exception to this requirement is when the submitted property information shows that the structure is outside the SFHA; in this case, the property is referred to as "out as shown." If elevation information is required for the LOMA request, an Elevation Certificate may be available from the community, or one can be prepared for the requester by a licensed Land Surveyor or registered Professional Engineer.

If the property has been elevated by fill, the requester will need to use the LOMR-F process. For a LOMR-F to be issued, the LAG must be at or above the BFE, and community floodplain officials must determine that the land and any existing or proposed structures to be removed from the SFHA are "reasonably safe from flooding." FEMA charges a fee for the engineering review of LOMR-Fs. Fee information is located at [http://www.fema.gov/fhm/fmc\\_fees.shtm](http://www.fema.gov/fhm/fmc_fees.shtm). In addition, the requester is responsible for providing all supporting information. The application forms for a LOMR-F request or for LOMA requests involving multiple residential lots or structures are available on the FEMA website at [www.fema.gov/plan/prevent/fhm/dl\\_mt-1.shtm](http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm).

Please send completed application forms to the attention of the LOMA Manager at the LOMC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075.



## How to Request a Letter of Map Amendment (LOMA) or Letter of Map Revision Based on Fill (LOMR-F)

### WHAT IF NO BFES HAVE BEEN DETERMINED?

In some instances, BFES for a certain SFHA have not yet been determined. FEMA will attempt to calculate the BFE when a LOMA application is submitted for properties of less than 50 lots or 5 acres. Sometimes, a BFE can be developed from sources such as U.S. Geological Survey topographic quadrangle maps. If that information is not available, the property owner will be asked to supply a survey for the property with the information necessary to allow FEMA to develop a site-specific BFE. National Flood Insurance Program (NFIP) regulations require that the requester determine the BFES for properties larger than 50 lots or 5 acres. A variety of computational methods can be employed to determine BFES, but these methods can be expensive. Before computational methods are used, every attempt should be made to obtain information, in the form of floodplain studies or previous computations, from Federal, State, or local agencies. Data obtained from these agencies may be adequate to determine BFES with little or no additional research, calculation, or cost.

The FEMA document *Managing Floodplain Development in Approximate Zone A Areas, A Guide for Obtaining and Developing Base (100-Year) Flood Elevations* provides guidance on computing BFES. This document, which can be viewed on the FEMA website ([www.fema.gov/pdf/fhm/fhm\\_zna.pdf](http://www.fema.gov/pdf/fhm/fhm_zna.pdf)), provides methods for developing BFES, as well as a list of agencies that can be contacted to determine whether BFE data are already available.

### HOW WILL A LOMA OR LOMR-F AFFECT MY FLOOD INSURANCE REQUIREMENT?

The Federal flood insurance requirement applies to structures in SFHAs that carry a mortgage backed by a federally regulated lender or servicer. If you have a LOMA or LOMR-F proving that your property is not in the SFHA, the mandatory Federal flood insurance requirement no longer applies. However, your lender still has the prerogative to require flood insurance as a condition of the loan. Even if your lender requires flood insurance, however, premiums are lower for structures outside the SFHA.

If FEMA issues a LOMA or LOMR-F and your lender agrees to waive the flood insurance requirement, you may be entitled to a refund of the premium paid for the current policy year. To cancel your policy, you can submit a copy of the LOMA or LOMR-F and the lender's waiver to your flood insurance agent or broker. The agent will send these documents and a completed cancellation form to the appropriate insurance provider.

It is important to note that approximately 30 percent of all flood insurance claims occur in areas designated as moderate or minimal flood risk. Therefore, not having a flood insurance policy could have disastrous consequences, leaving you with no financial protection from future flood losses. FEMA recommends flood insurance coverage, even if it is not required by law or a lender. The good news is that you may be eligible to pay much less for flood insurance coverage if your property is removed from the SFHA.

### Quick Facts

**LOMA requests involving one or more structures:** the LAG must be at or above the BFE.

**LOMR-F requests:** the LAG must be at or above the BFE, and community floodplain officials must determine that the land and any existing or proposed structures to be removed from the SFHA are "reasonably safe from flooding."

**LOMA requests involving one or more lots:** the lowest point on each lot must be at or above the BFE.

**Review and processing fee:** FEMA does not charge a fee to review a LOMA request, but there is a fee for the engineering review of LOMR-Fs.

**Required information:** the requester is responsible for providing all the information needed for the review, including (if necessary) elevation information certified by a licensed Land Surveyor or registered Professional Engineer.

## Attachment 5: *Joining the CRS Program*, FEMA Fact Sheet



## **Joining the Community Rating System**

**What it is:** The Community Rating System (CRS) is a program administered by the Federal Emergency Management Agency. It provides lower insurance premiums under the National Flood Insurance Program. The premium reduction is in the form of a CRS Class, similar to the classifications used for fire insurance. A Class 1 provides a 45% premium reduction. A Class 10 provides no reduction.

The CRS Class is based on the floodplain management activities a community implements. In many cases, these are activities already implemented by the community, the state, or a regional agency. The more activities implemented, the better the CRS class.

### **Benefits:**

- Money stays in your community instead of being spent on insurance premiums.
- Every time residents pay their insurance premiums, they are reminded that the community is working to protect them from flood losses, even during dry years.
- The activities credited by the CRS provide direct benefits to the community, including:
  - Enhanced public safety,
  - Reduction in damage to property and public infrastructure,
  - Avoidance of economic disruption and losses,
  - Reduction of human suffering, and
  - Protection of the environment.
- Local flood programs will be better organized and more formal.
- The community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.
- Technical assistance in designing and implementing some activities is available at no charge.
- The community will have an added incentive to maintain its flood programs over the years.
- The public information activities will build a knowledgeable constituency interested in supporting and improving flood protection measures.

### **Cost to the local government:**

- The community must have a successful Community Assistance Visit.
- The community must designate a CRS Coordinator who prepares the application papers and works with FEMA and the Insurance Services Office (ISO) during the verification visit.
- Each year the community must recertify that it is continuing to implement its activities. It must provide copies of relevant materials (e.g., permit records).
- The community must maintain elevation certificates, permit records, and old Flood Insurance Rate Maps forever.
- The community must maintain other records of its activities for five years, or until the next ISO verification visit, whichever comes sooner.

May 2008

## Attachment 6: *Coordinated Needs Managements Strategy* (CNMS), FEMA Fact Sheet



FEMA



# Coordinated Needs Management Strategy (CNMS)

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program and provides reliable flood hazard data and maps for the United States. Floodplains are constantly changing, a characteristic that makes managing and mapping them a challenge. Updates to Flood Insurance Rate Maps (FIRMs) will always be needed because the physical environment, climate patterns, and engineering methods (PCE) may change. FEMA recognizes that mapping needs include areas where mapping has not occurred or where previously performed flood studies have been questioned because of one or more factors related to changes in PCE. An important step in maintaining FIRMs is assessing FEMA's inventory of floodplain studies to determine whether the conditions on the ground are still satisfactorily represented on a FIRM. Whenever the information on a FIRM is not representative of actual conditions, it is considered a mapping need and will be considered by FEMA for a new study. FEMA is mandated by the National Flood Insurance Reform Act of 1994 to assess all FIRMs once every five years to determine which ones need to be revised.

FEMA uses modern geospatial technologies and current FEMA policies, requirements, and procedures to coordinate the management of mapping needs in a comprehensive approach. This is referred to as the Coordinated Needs Management Strategy (CNMS). CNMS uses existing digital map data to inventory and manage flood map update issues and support FIRM revision and production planning activities.

The vision for Risk Mapping, Assessment and Planning (Risk MAP) is to analyze and depict risk so that communities and the public can understand their risk and make informed decisions to safeguard their lives and property. The CNMS inventory contributes to the identification of risk in two important ways. The first is by indicating where the depiction of flood hazards on FIRMs has been validated through detailed assessment. The second is by showing which previously studied or unstudied floodplains inadequately represent flood hazards. In this way, CNMS leads to the improvement of flood hazard data.

## Additional Information

- CNMS is FEMA's strategy for coordinating the management of mapping needs using modern geospatial technologies and current policies, requirements, and procedures.
- CNMS makes information related to mapping needs readily accessible and more usable because the needs information is stored in a predictable, standardized, and digital format. CNMS reference materials are available through the FEMA Regional offices.
- For more information about CNMS please reference "Procedure Memorandum No. 56: Guidelines for Implementation of Coordinated Needs Management Strategy (CNMS):" <http://www.fema.gov/library/viewRecord.do?id=4542>

**RiskMAP**  
Increasing Resilience Together

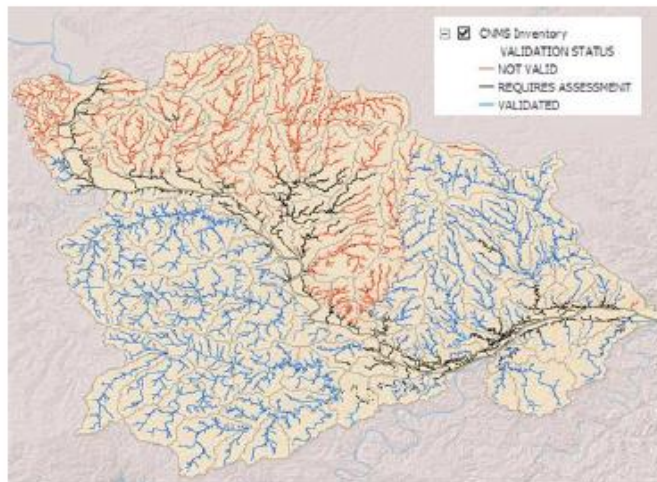
March 2011

[www.fema.gov/plan/prevent/fhm/rm\\_main.shtml](http://www.fema.gov/plan/prevent/fhm/rm_main.shtml) • 1-877-FEMA MAP

*Discovery Report:  
Lake Ontario (Lower Genesee Watershed) Study Area, New York*

## Tracking of Engineering Analyses

One of the goals of CNMS is to assess the validity of engineering study data through a series of triage checks. The engineering study validation process evaluates whether or not there is an adequate level of flood hazard risk identified on a community's FIRM. The process evaluates the existing floodplain study against 17 possible change indicators that may have occurred since the date of the effective analysis, not the map date. These elements include changes in land use, new/removed bridges and culverts, and accounting for recent flood events captured by gage data. When a floodplain study is found to be deficient as a result of this validation process, it is labeled as "Invalid" in the CNMS database. FEMA utilizes CNMS to report New, Valid, or Updated Engineering (NVUE). NVUE metrics distinguish between engineering studies that adequately identify the level of flood hazard risk from those that are in need of restudy.

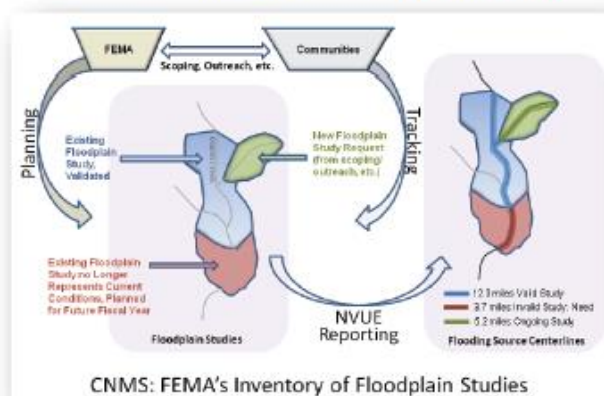


## CNMS Lifecycle



FEMA's mapped inventory will be managed by changing the validation status of existing floodplain studies, adding new study needs to the inventory, updating the status associated with studies in progress, and including new input and requests from communities. The changing validation status of existing floodplain studies is affected by PCE. The assessment of each floodplain study also has a limited shelf life. FEMA will be assessing the inventory of each community's floodplain studies every 5 years for as each floodplain study is to be re-evaluated or validated this frequency.

FEMA may choose to assess, restudy, or defer portions of their inventory dependant on available resources. Floodplain studies in CNMS that are determined to be 'Invalid' are eligible to receive resources for restudy based on annual production planning criteria and can identify that a study is planned or underway. For studies to go from 'Invalid' to 'Valid' status, they must be restudied. Requests for mapping of previously unmapped areas can be added to the inventory of studies and will, when completed, join the study reassessment schedule.



March 2011

[www.fema.gov/plan/prevent/fhm/rm\\_main.shtml](http://www.fema.gov/plan/prevent/fhm/rm_main.shtml) - 1-877-FEMA MAP