Discovery Report

Lake Ontario – Chaumont-Perch Watershed HUC 04150102

Jefferson County, 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 Chaumont-Perch 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 Chaumont-Perch 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.

Jefferson County

*Adams, Town of***
*Alexandria, Town of***
Brownville, Town of*
Cape Vincent, Town of*
Chaumont, Village of
Clayton, Town of*
Henderson, Town of*
Hounsfield, Town of*
*Le Ray, Town of***
Lyme, Town of*
Orleans, Town of*
Pamelia, Town of*
*Theresa, Town of***
Sackets Harbor, Village of
Watertown, City of*
Watertown, Town of*

*Partially within the Chaumont-Perch Watershed
***Partially within the Chaumont-Perch 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 Chaumont-Perch 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.

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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)

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

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 coastal data, and current flood mitigation activities within the Lake Ontario basin in New York. This includes the Chaumont-Perch 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 Chaumont-Perch 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 Chaumont-Perch Watershed Discovery project was developed. The Chaumont-Perch Watershed is a relatively small HUC-8 watershed containing only 12 communities and one county. Many communities in both counties still have the older paper Flood Insurance Rate Maps (FIRMs) developed during the 1980s and 1990s. There is development pressure along the major waterbodies, including Lake Ontario and the Chaumont River, which would benefit from updated mapping and the development of Base Flood Elevations (BFEs). The new detailed studies along key stream segments, combined with updated approximate studies in a new digital format, would be sufficient to assist with enforcement and support safe development. The resulting scope of work resulted in seven stream study requests for a total of 35.1 miles of new detailed study, one approximate study request for a total of 6.7 miles, plus a request for a detailed restudy of the Lake Ontario shoreline. More specific information on stream study requests and other community

needs collected through the Discovery process can be found in Table 24: *Summary of Community Floodplain Mapping Needs* of this report. A copy of the recommended scope of work can be found in Appendix O: *Chaumont-Perch 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 Chaumont-Perch Watershed, as described in Section II: *Chaumont-Perch 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 Chaumont-Perch Watershed, provide users with an in-depth understanding of historical flood risk, existing 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 Chaumont-Perch 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 Table 25: *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 Chaumont-Perch Watershed Discovery project are shown in Table 1: *Summary of Chaumont-Perch Watershed Community Mapping Priorities.*

The most pressing issue for communities in the Chaumont-Perch Watershed is the age of the existing Flood Insurance Rate Maps (FIRMs). Many communities still regulate their floodplains using the old flat style paper maps that were issued in the late 1970s and early 1980s. Communities in the Chaumont-Perch Watershed are experiencing growth along the major waterbodies and updated digital products are needed to effectively manage this growth 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.

Table 1: Summary of Chaumont-Perch Watershed Community Mapping Priorities

County	Communities	Priorities
Jefferson	Town of Brownville, Town of Cape Vincent, Town of Henderson, Town of Hounsfield	The Lake Ontario shoreline should be restudied using detailed methods. This request was made by several communities due to development along the lakefront and the lack of detailed mapping. A BFE would be useful in aiding community official regulating development. Some of the lower elevation areas along the lakeshore flood which impacts roads and access to properties.
	Town of Clayton, Town of Orleans, Jefferson County	The Chaumont River should be studied using detailed methods in the Towns of Clayton, Lyme, and Orleans for a distance of 17.6 miles. The Town of Orleans is experiencing development pressure along the Chaumont River and updated BFEs would be useful. The Town of Clayton experiences flooding along the Chaumont River near the Route 12 Bridge in Depauville, especially during the spring thaw and due to ice jams.
	Town of Brownville, Jefferson County	The Perch River should be studied using detailed methods for 9.6 miles in the Town of Brownville. Jefferson County has requested that this stream be studied due to the age and lack of detail on the current FEMA FIRM for the Town of Brownville.
	Village of Chaumont, Town of Lyme	Horse Creek should be studied by detailed methods for 3.8 miles within the Town of Lyme and the Village of Chaumont. There is a significant elevation drop in the creek as it enters the village which causes water to back up into the Town of Lyme. The stream is currently not mapped within the village.
	Town of Lyme	Soper Creek should be studied by detailed methods for 1.0 mile in the Town. The current study is outdated and there is dense development along Three Mile Bay. Three Mile Creek should be studied by detailed methods for 1.0 mile in the Town. The stream is currently an approximate study and the Town requested it be upgrade to a detailed study due to the amount of development near the stream.
	Village of Sackets Harbor	Mill Creek should be studied by detailed methods for 1.1 miles in the Village of Sackets Harbor due to increased development in the area.

County	Communities	Priorities
Jefferson, Cont'd	Town of Henderson	Rays Bay Road Creek should be a new detailed study from the confluence with Rays Bay to a point approximately 1 mile upstream due to repeated flooding in the area.

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 Table 2: *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
Jefferson	Jefferson County	Political Boundaries	Jefferson County Real Property Office
	Jefferson County	Parcel and Zoning Boundaries	Jefferson County Planning Department
	Jefferson County	Land Use and Soil Type	Jefferson County Soil and Water Conservation District
	Town of Clayton	Bathymetry	Development Authority of the North Country
	Town & Village of Clayton	Joint Waterfront Revitalization Plan	Town of Clayton

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 Chaumont-Perch 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. Table 3: *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
Jefferson	Town of Chaumont	Floodplain Management Building and Enforcement Guidance Hazard Mitigation Training Other – Training for Political Officials requested
	Town of Henderson	Floodplain Management Building and Enforcement Guidance Hazard Mitigation Training
	Town of Hounsfield	Floodplain Management Building and Enforcement Guidance Hazard Mitigation Training Other – Training on how to use the environmental mapped on the NYSDEC website
	Town of Pamelia	Floodplain Management Building and Enforcement Guidance Hazard Mitigation Training

Overall, the Chaumont-Perch 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. Jefferson County communities are experiencing growth along the major water bodies and are seeing the conversion of summer cottages to year round residences. 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: Chaumont-Perch 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 is gathered and prepared at the national and regional level

and augmented by community supplied flood risk information and data collected during the Discovery process. Community participation is necessary to assure that FEMA has the most up-to-date understanding of a community's flood risk.

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 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 Chaumont-Perch Watershed is shown in teal in Figure 1 and includes portions of Jefferson County.

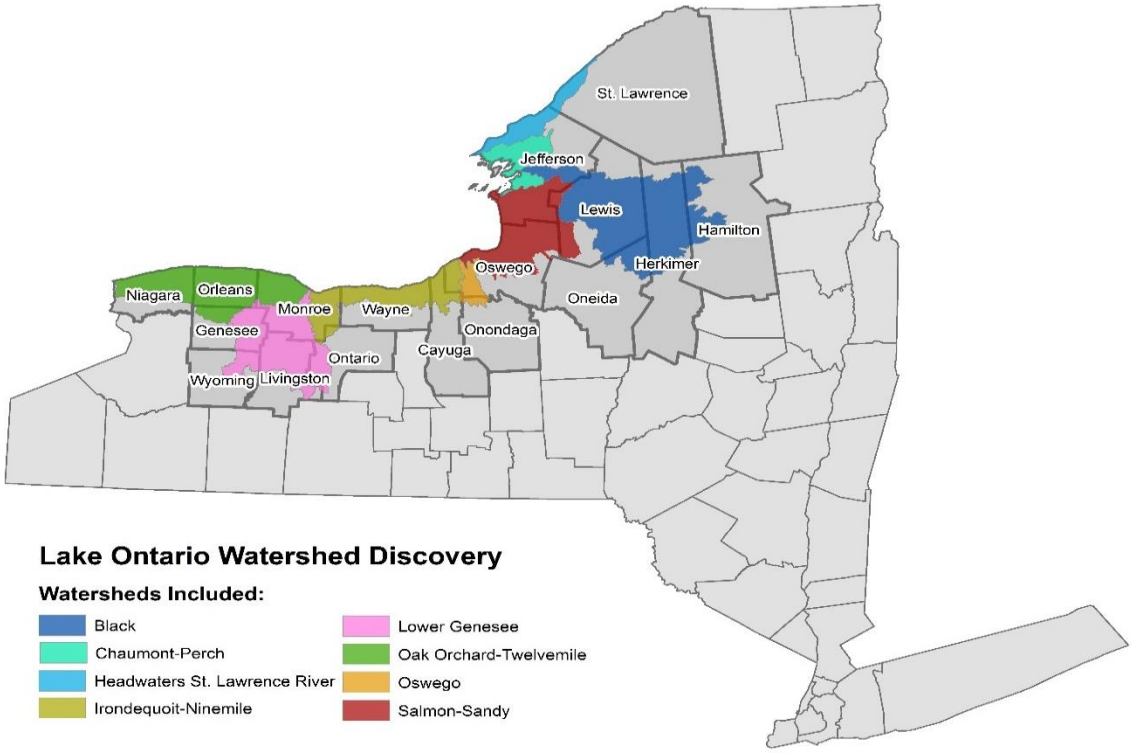

Figure 1: Watersheds Included Within the Lake Ontario Discovery Project

Coastal Barriers 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, Gulf of Mexico, 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 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 nine locations within Jefferson County, including the following areas: Wilson Bay, Grenadier Island, Fox Island, The Isthmus, Point Peninsula, Hounsfield, Dutch John Bay, Sherwin Bay, and Association Island. Six of these units fall within the Chaumont – Perch Watershed. Figure 2 shows the location of the CBRS units around Lake Ontario in the vicinity of the Chaumont-Perch 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 will be added to the Discovery Map.

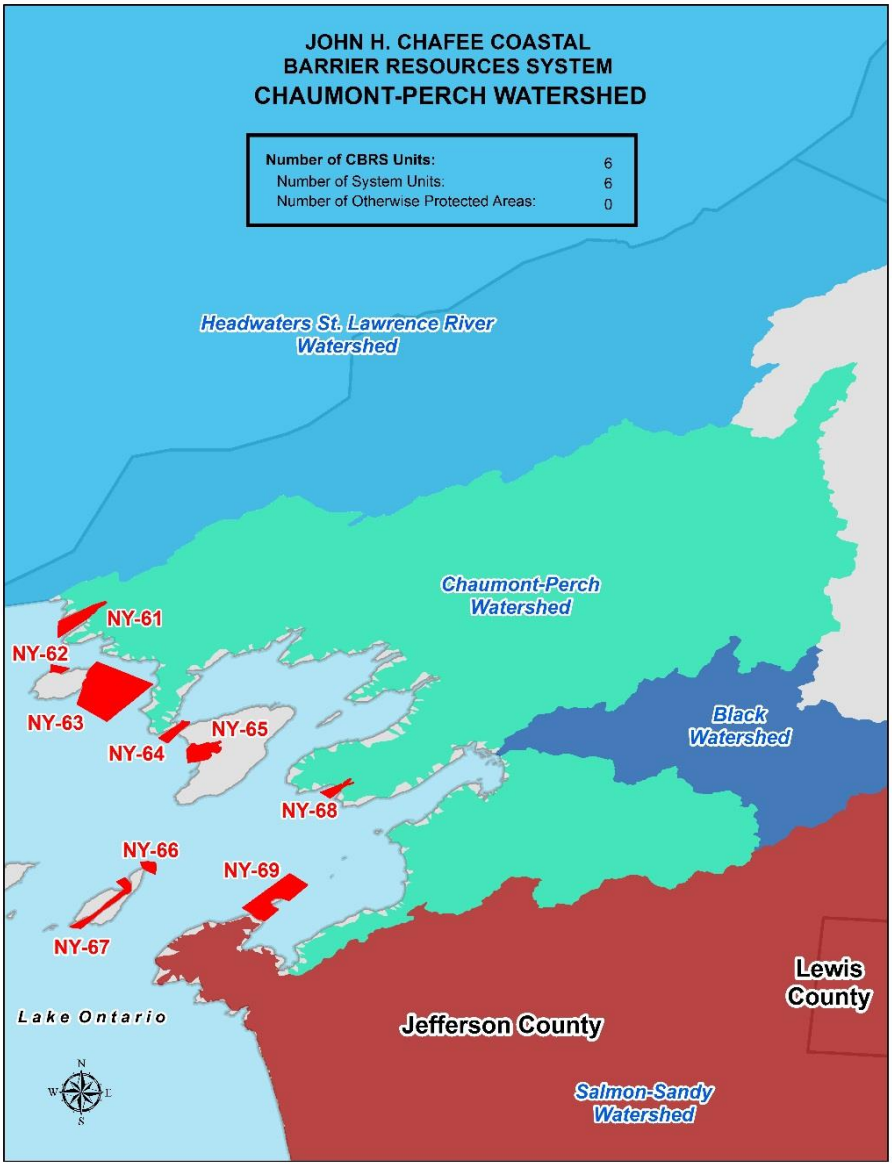

Figure 2: CBRS Units

Stakeholder Coordination

Pre-Discovery Meetings (via WebEx)

To begin this effort, the 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 Jefferson County in the summer of 2013 for the purpose of examining the flood mapping, mitigation, planning, and other needs of communities within the county comprising the Chaumont-Perch 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 time 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 Chaumont-Perch 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. Chaumont-Perch Watershed Overview

Geography

The Chaumont-Perch Watershed (Figure 3) is located along the northeast shore of Lake Ontario in New York State. It lies adjacent to the St. Lawrence Watershed to the south. The entire watershed lies within Jefferson County. The watershed occupies 227,042 acres and ranges in elevation from 243 to 984 feet above sea level (current lake level). The highest elevations are on the eastern portions of the watershed where the watershed meets the Tug Hill Plateau. **(NRCS)**

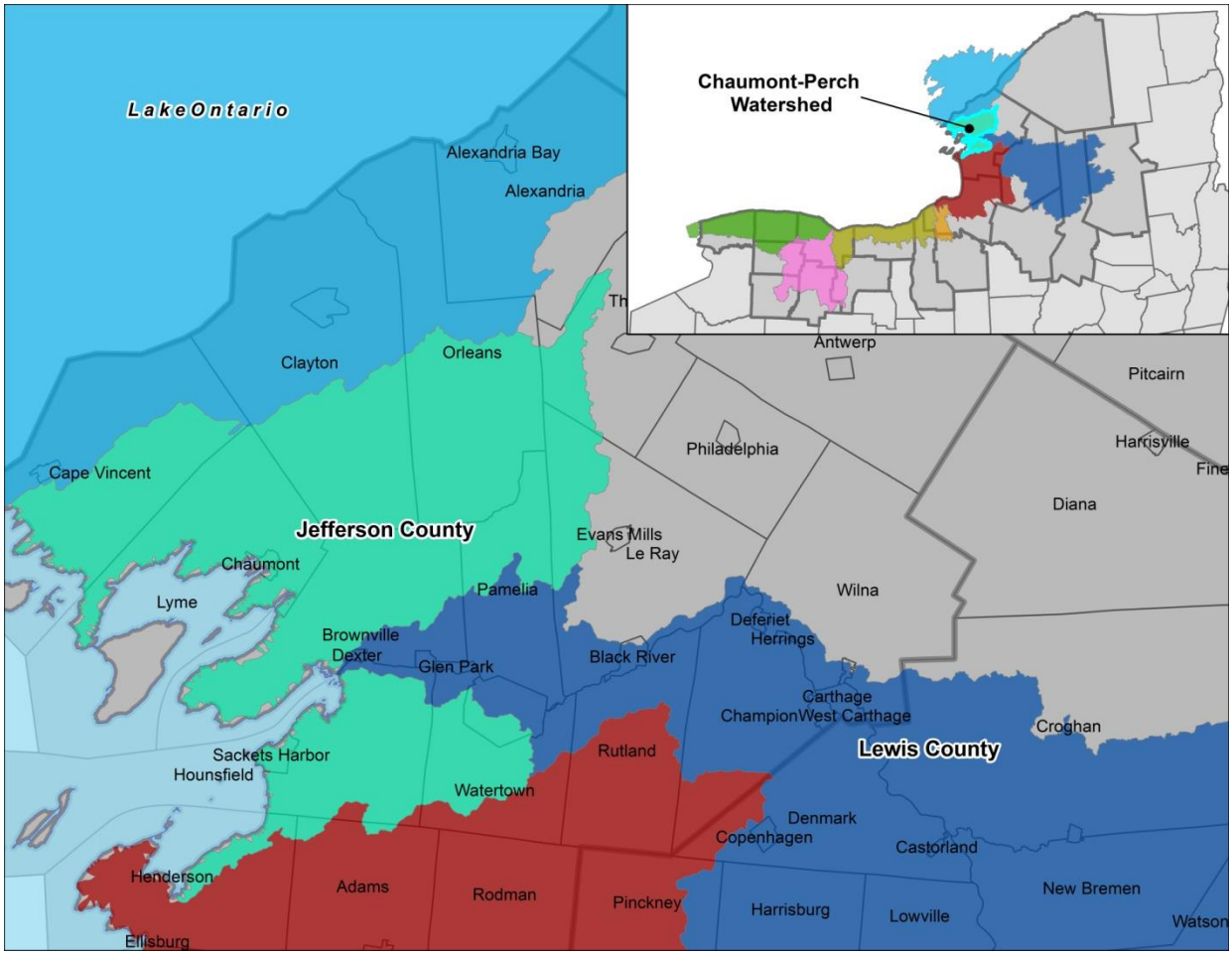

Figure 3: Chaumont – Perch Watershed Communities

Property Ownership

Land ownership in the watershed is diverse. Urban areas make up 1% of the Chaumont-Perch Watershed. The only area within the watershed considered urban is Watertown. Agriculture is mostly spread evenly throughout the watershed. There are approximately 250 farms in the watershed and most of the operations are medium sized. Farm operations in the watershed are split pretty evenly between milk cow, beef cow and horse operations. Haylage is the predominant crop followed by corn for silage then corn for grain. (NRCS)

The entire Chaumont-Perch Watershed lies within Jefferson County, New York. Jefferson County is located in northeastern New York State, adjacent to the area where the St. Lawrence River exits Lake Ontario to the northeast of Syracuse, northwest of Utica, and lies at the border of New York State and Canada. The County is bounded by the St. Lawrence River and St. Lawrence County to the north, Lake Ontario to the west, Lewis County to the east, and Oswego County to the south. According to the U.S. Census Bureau, Jefferson County has a total area of 1,285 square miles, (3,328 km^2), of which 136 square miles (352 km^2) (11 percent) is within the Chaumont-Perch Watershed. Jefferson County is also part of the St. Lawrence-Champlain Plain and is comprised of nearly level to rolling landscapes in the St. Lawrence Valley with elevations

ranging from 80 to 1,000 feet increasing gradually from the St. Lawrence River southward and from Lake Champlain to the east and west. The northern border of Jefferson County is part of the Thousand Islands Region and St. Lawrence Seaway which serves as the gateway from the Great Lakes to the Atlantic Ocean for water-going vessels. The majority of employment is within government, education, health care, manufacturing, and food processing. Major employers include Fort Drum, New York State government, Samaritan Medical Center, Jefferson County government, Watertown City School District, Jefferson Rehabilitation Center, Indian River School District, Carthage School District, Jefferson-Lewis BOCES, Convergys, Carthage Area Hospital, South Jefferson School District, City of Watertown, New York Air Brake, Car Freshner Corp, Jefferson Community College, Watertown Family YMCA, Scholastic Structures, Johnson Newspaper Corp, and National Grid. According to the USDA 2007 Census of Agriculture, there are approximately 885 farms throughout Jefferson County, consisting of 262,311 acres of farmland. Of the 885 farms, 248 of the farms are located within the Chaumont-Perch 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
Jefferson	http://www.co.jefferson.ny.us/index.aspx?page=98

Demographics

In New York, Chaumont-Perch Watershed covers parts of over 13 cities, towns, and villages. Jefferson County is part of the Watertown-Fort Drum Metropolitan Statistical Area. The distribution of population by county in the watershed can be seen in Table 5: *Approximate 2010 Population in the Chaumont-Perch Watershed.*

During the in-person meetings several communities noted current and future development pressures near flooding sources, which have been included in Table 25: *Summary of Community Floodplain Mapping Needs*. Areas of development and redevelopment include the extent of the Lake Ontario shoreline, Chaumont River in the Village of Chaumont, and Mud Bay in the Town of Cape Vincent.

Table 5: Approximate 2010 Population in the Chaumont-Perch Watershed

County	Total County Population (2010 data)	Percent of County Population in Chaumont-Perch Watershed	2010 Estimated Population in the Chaumont-Perch Watershed (Based on % in watershed * Total Population)	Square Miles in Chaumont-Perch Watershed
Jefferson	116, 229	30%	34,868	382.62 square miles

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.

National Land Cover Database (NLCD) is broken down by land cover classes. Grasslands account for the majority (40.2%) of the Chaumont-Perch Watershed, followed by forest (21.1%), wetland (13.7), cultivated crops (9.8%), shrub (7.8%), development (5.7%), open water (1.7 %), and barren land (0.01%). (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
Jefferson	http://www.co.jefferson.ny.us/index.aspx?page=98

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
Jefferson	1,285	73,453	73,453	248

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 Chaumont-Perch 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 Table 25: *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 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 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 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 A Zone involving 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 the 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 Chaumont-Perch 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 Chaumont-Perch 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 NLD, USACE NID, FEMA 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
Hazards Mitigation Plans and Status	NYSDHSES
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 Chaumont-Perch Watershed were obtained from the report called FEMA Hazus AAL Usability Analysis and are shown in Table 9: *Hazus-MH AAL Data for Chaumont-Perch Watershed*. AAL data summarized at the census block level are shown on Discovery Maps. AAL data is also available in Appendix K: *FEMA Hazus-MH Average Annualized Loss (AAL).*

Approximately one-quarter of the losses in Jefferson County are within the Chaumont-Perch Watershed. Significant loss is shown in the vicinities of the Town of Hounsfield and Village of Sackets Harbor near the shorelines and Mill and Bedford Creeks. AAL losses follow the Lake Ontario shoreline as well as major streams within the watershed, including Chaumont River, Perch River, Mill Creek, Three Mile Creek, and Horse Creek. No AAL loses are reported for the City and Town of Watertown within the Chaumont-Perch Watershed but are included within the Black River Watershed.

Table 9: 2010 Hazus-MH AAL Data for Chaumont-Perch Watershed

Community	Building Loss (in thousands of dollars)	Contents Loss (in thousands of dollars)	Total Loss (in thousands of dollars)
Brownville, Town of	$30,000	$20,000	$50,000
Cape Vincent, Town of	$10,000	$5,000	$15,000
Chaumont, Village of	$18,000	$23,000	$41,000
Clayton, Town of	$6,000	$2,000	$8,000
Henderson, Town of	$17,000	$18,000	$35,000
Hounsfield, Town of	$103,000	$67,000	$170,000
Lyme, Town of	$57,000	$41,000	$98,000
Orleans, Town of	$0	$0	$0
Pamelia, Town of	$2,000	$12,000	$14,000
Sackets Harbor, Village of	$15,000	$9,000	$24,000
Watertown, City of	$0	$0	$0
Watertown, Town of	$0	$0	$0

Source: FEMA HAZUS AAL Usability Analysis 2012

Gage Data

Stream Gages

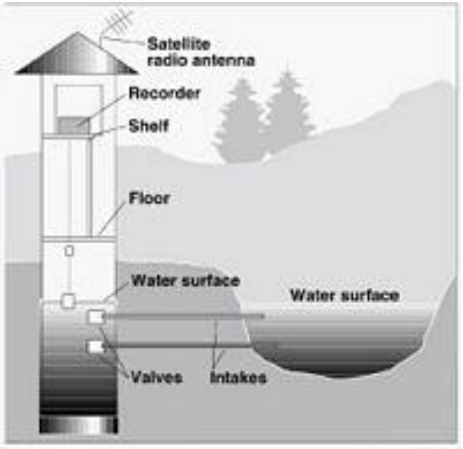

Figure 4: Typical Modern USGS Stream Gage

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 4: *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 the USGS's factsheet on stream gaging at http://pubs.usgs.gov/fs/2005/3131. There are no known gages in the watershed that are monitored by USGS and NYSDEC.

Rain Gages

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

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

Levees

A review of current and preliminary FIRMs indicates that there are no identified levees in the study area.

Dams

According to the NYSDEC Dam Safety Section's dam inventory, the Chaumont-Perch Watershed contains 19 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 Chaumont-Perch 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 10: *Dams in the Chaumont-Perch Watershed* shows the classification of dams located in the Chaumont-Perch 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 10: Dams in the Chaumont-Perch Watershed

County	Low Hazard Class A	Intermediate Hazard Class B	High Hazard Class C	Negligible Class D	Unclassified Class 0	Total
Jefferson	15	0	0	4	0	19

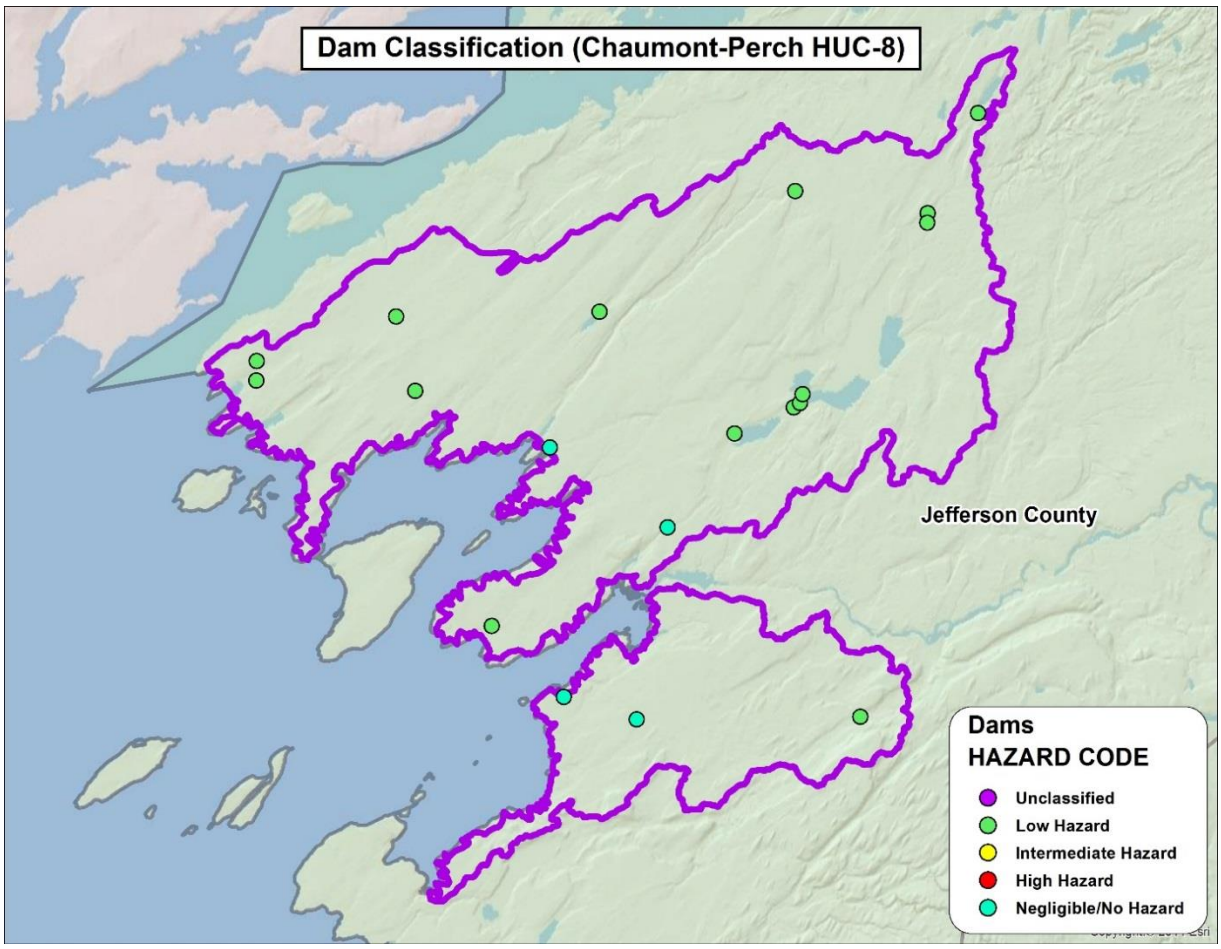

Figure 5: Dams in the Chaumont-Perch Watershed

Watershed Boundaries

The Chaumont-Perch Watershed is a HUC-8 watershed. Figure 6 shows the boundaries of the Chaumont-Perch 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 he next two digits of the HUC are the code for the Subregional Boundary (e.g., 0415, Southeastern Lake Ontario). The next two digits are the code for the Accounting Unit (e.g., 041401, Northeastern Lake Ontario, New York). The next two digits of the HUC are the Cataloging Unit (e.g., 04150102 Chaumont-Perch). Table 11: *Chaumont-Perch Watershed* lists the HUC-8 code for the watershed.

Table 11: Chaumont-Perch Watershed

HUC 8 Code	Name
04150102	Chaumont-Perch

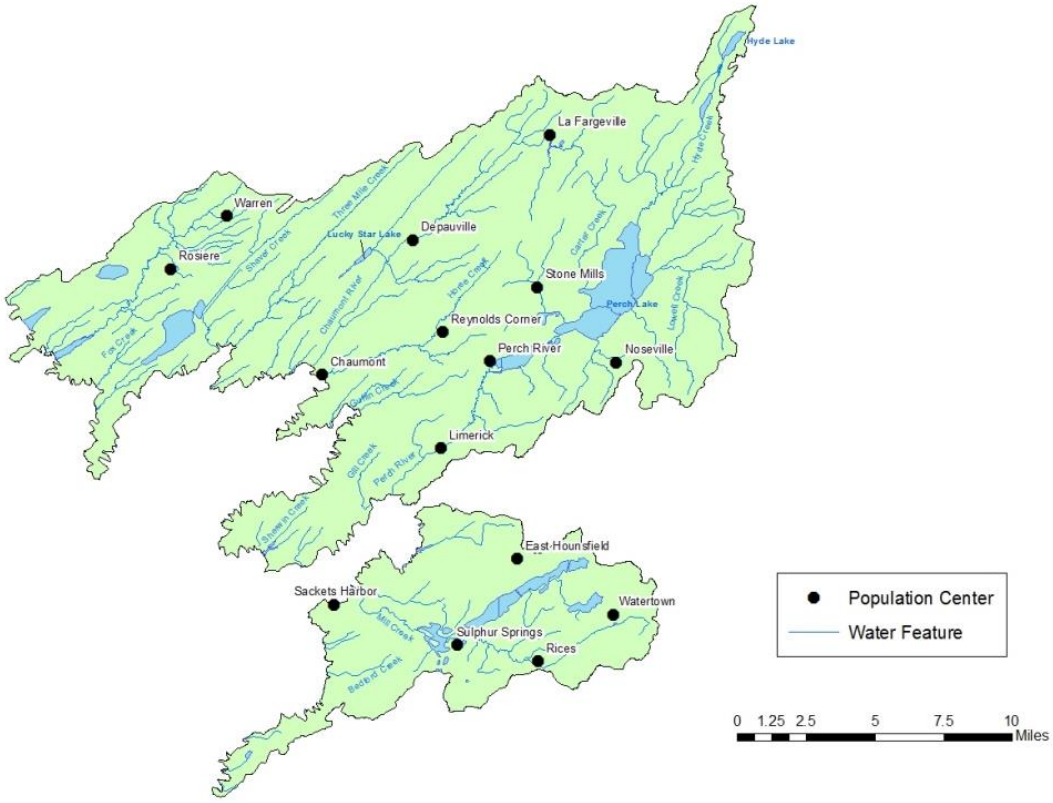

Figure 6: Chaumont-Perch Watershed

Bathymetry

FEMA will use data from the following bathymetric and topographic sources: For the topography, FEMA will use data flown by the USACE on June 6 – Sept 23, 2011. The data has a 500-meter inland buffer from the shoreline along the lake, and also has bathymetric data in the collection. The data has 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 NYS GIS Clearinghouse. During the Discovery meetings, boundary changes were noted for the City of Watertown, Town of Pamelia, Village of Chaumont, and Village of Dexter and have been captured in FEMA's CNMS.

Shoreline Change Information

The Chaumont-Perch Watershed study area has approximately 82 miles of shoreline along Lake Ontario, contained within Jefferson 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 that 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. Though not related to coastal erosion, during the Discovery Meetings the Town of Lyme noted areas of erosion along the low shoreline.

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 NYS GIS 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 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 Chaumont-Perch Watershed in New York covers parts of Jefferson County. The mapping in place is a mix of recently revised and older FIRMs.

In Jefferson County there is an effective partial countywide covering the Town of Le Ray and the Village of Black River dated January 8, 2014. This partial countywide provided an updated analysis of the Black River running through these two communities. The remaining Jefferson County communities have community-based maps with dates that range from 1977-2002. Federal flood insurance is not available in communities that do not participate in the NFIP.

The effective countywide FIRM for each of the participating communities is shown in Table 12: *FIRM Effective Dates*.

Table 12: FIRM Effective Dates (as of August 2013)

Coastal	Community	FIRM Effective Date	Notes
Yes	Brownville, Town of	6/2/1992	Partial Countywide for areas outside the Chaumont-Perch Watershed (Effective 1/8/2014). No updated mapping performed under FEMA's Map Modernization program for communities in the study area. Community-based flood maps remain in effect.
	Cape Vincent, Town of	6/2/1992	
	Chaumont, Village of	9/8/1999	
	Henderson, Town of	5/18/1992	
	Hounsfield, Town of	5/18/1992	
	Lyme, Town of	9/2/1993	
	Sackets Harbor, Village of	5/2/1994	
No	Clayton, Town of	4/2/1986	
	Orleans, Town of	3/1/1978	
	Pamelia, Town of	1/2/1992	
	Watertown, City of	9/29/1996	
	Watertown, Town of	8/2/1993	

Ordinances

The project area's local jurisdictions have a patchwork of regulations regarding development within known SFHAs, ranging from ordinances with minimum NFIP requirements to strong, pro-active ordinances that not only regulate and protect new and improved development in existing SFHAs, but seek to mitigate the growth of SFHAs caused by increased runoff from developed areas and the degradation of natural flood control areas, such as wetlands and forests. The NFIP uses six different ordinance levels (60.3 land-use classification levels).

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

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

2. The "D" type should be used when 1-percent-annual-chance floodplains without 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.

Table 13: *Program Status and Ordinance Level* lists the Program Status and Ordinance Level for each community.

Table 13: Program Status and Ordinance Level (as of August 2013)

Community	Program Status	Ordinance Level
Brownville, Town of	Regular	D
Cape Vincent, Town of	Regular	D
Chaumont, Village of	Regular	D
Clayton, Town of	Regular	D
Henderson, Town of	Regular	D
Hounsfield, Town of	Regular	D
Lyme, Town of	Regular	D
Orleans, Town of	Regular	D
Pamelia, Town of	Regular	D
Sackets Harbor, Village of	Regular	D
Watertown, City of	Regular	D
Watertown, Town 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, there were 285 policies in-force accounting for $48,228,300 in Insurance Coverage and $207,513 in written premiums, within the study area. The number of policies, total coverage, and total premium costs are listed in Table 14: *Flood Insurance Policy and Claims Data.*

The City of Watertown has 63 insurance policies and over $10 million in insurance coverage, followed by the Town of Lyme with 53 policies and $8 million insurance in-force. The Village of Sackets Harbor has the highest value of insurance-in force ($1,774,700) when compared to the total number of policies (7) for a community. The Town of Hounsfield has the second highest value of insurance-in-force ($1,968,900) compared to the 9 insurance policies in place for the Town.

Table 14: Flood Insurance Policy and Claims Data (as of August 2013)

Community	Number of Policies	Insurance In-force	Written Premium In-force	Number of Claims	Totals Claims Paid
Brownville, Town of	32	$5,695,000	$22,369	11	$ 284,056
Cape Vincent, Town of	27	$3,794,100	$21,301	5	$ 10,692
Chaumont, Village of	6	$728,700	$5,952	7	$ 7,660
Clayton, Town of	16	$2,761,600	$8,913	7	$ 12,372
Henderson, Town of	33	$5,245,200	$23,356	15	$ 18,491
Hounsfield, Town of	9	$1,986,900	$6,162	0	$ 0
Lyme, Town of	53	$8,132,400	$33,171	6	$ 3,925
Orleans, Town of	23	$4,698,000	$15,689	N/A	N/A
Pamelia, Town of	9	$1,653,700	$3,292	2	$ 4,700
Sackets Harbor, Village of	7	$1,774,700	$6,854	4	$ 1,115
Watertown, City of	63	$10,779,000	$57,084	19	$ 52,745
Watertown, Town of	7	$979,000	$3,370	5	$ 9,049

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 feels 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.

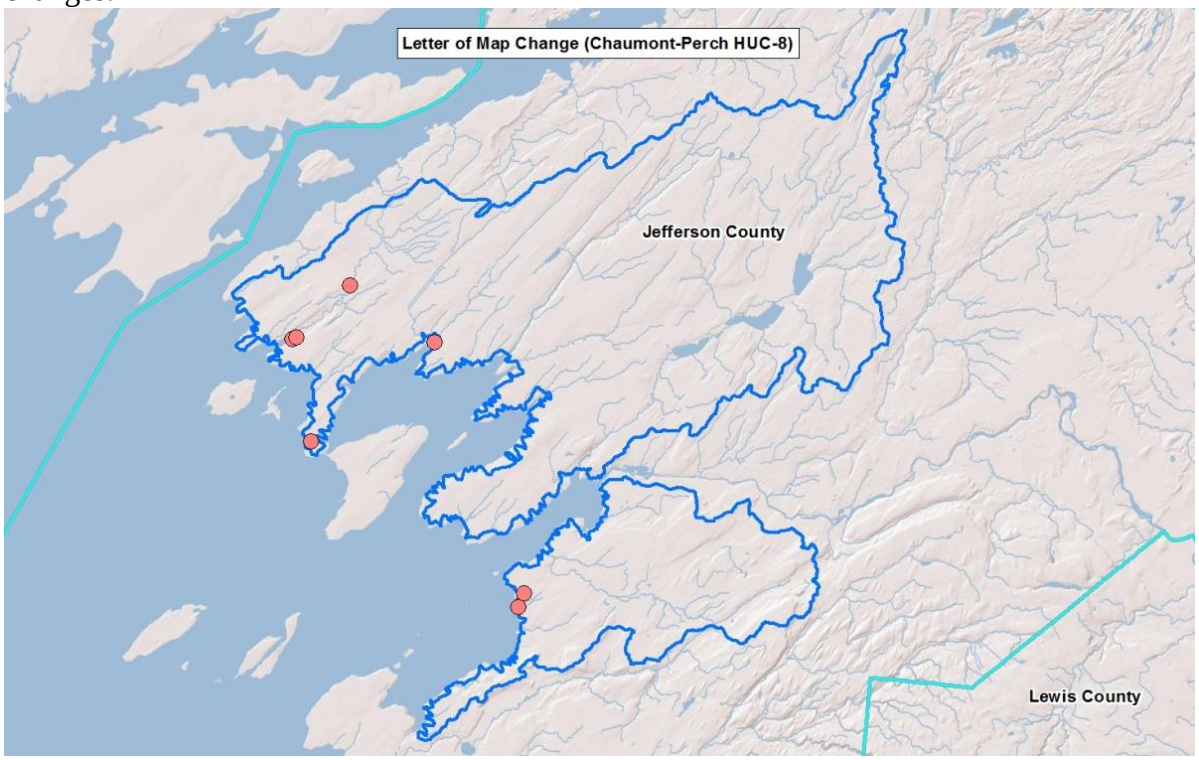

Table 15: *LOMCs in the Project Area* and Figure 7 highlight the areas within the Chaumont-Perch Watershed that have LOMCs. There are seven LOMAs/LOMR-Fs and no LOMRs located in the Chaumont-Perch Watershed.

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 15: LOMCs in the Project Area (as of August 2013)

Community	Number of LOMA/ LOMR-Fs	Number of LOMRs	FIRM Effective Date
Brownville, Town of	0	0	6/2/1992
Cape Vincent, Town of	3	0	6/2/1992
Chaumont, Village of	0	0	9/8/1999
Clayton, Town of	0	0	5/18/1992
Henderson, Town of	0	0	5/18/1992
Hounsfield, Town of	2	0	9/2/1993
Lyme, Town of	2	0	5/2/1994
Orleans, Town of	0	0	4/2/1986
Pamelia, Town of	0	0	3/1/1978
Sackets Harbor, Village of	0	0	1/2/1992
Watertown, City of	0	0	9/29/1996
Watertown, Town of	0	0	8/2/1993

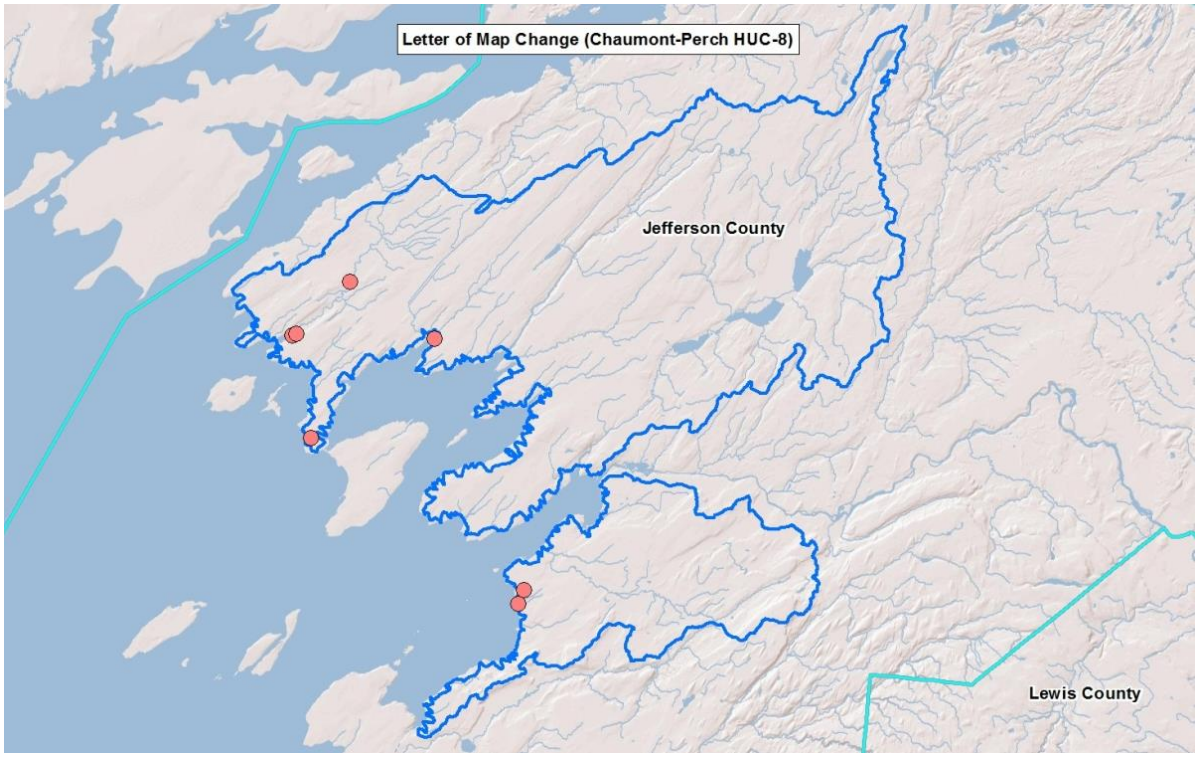

Figure 7: Location of LOMCs in the Chaumont-Perch Watershed

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.

Table 16: *CAVs Performed Within the Project Area* lists the CAVs performed within the project area. No open CAVs were found for the communities in the Chaumont-Perch Watershed. All but two communities have met with NYSDEC or FEMA regarding their floodplain management programs. Engineering violations made up the majority of issues noted for the CAVs in Jefferson County. 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 administrating the NFIP in their community.

Table 16: CAVs and CACs Performed Within the Project Area (as of September 2013)

Community	CAV Date	CAC Date
Brownville, Town of	9/17/2009	03/25/1996
Cape Vincent, Town of	12/18/2001	05/21/2003

Community	CAV Date	CAC Date
Chaumont, Village of	5/19/1993	N/A
Clayton, Town of	6/25/2004	01/28/1992
Henderson, Town of	2/8/2012	12/20/2006
Hounsfield, Town of	N/A	03/27/1996
Lyme, Town of	9/15/2009	03/14/2011
Orleans, Town of	8/27/1997	N/A
Pamelia, Town of	8/24/2009	N/A
Sackets Harbor, Village of	N/A	11/19/2012
Watertown, City of	8/4/1993	05/01/2003
Watertown, Town of	7/7/1993	N/A

N/A – No information available

Community Rating System (CRS)

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.

No communities within the study area participate in CRS. A local community example within the Lake Ontario Watershed basin is the Town of Greece in Monroe County. The community became a Class 8 participating CRS community on May 1, 2013. For more information on CRS, please see Attachment 5: *Joining the CRS Program,* or visit FEMA's CRS website.

A particular emphasis on 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 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 Chaumont-Perch Watershed, there were 2 losses for a RL property as of May 2015. Two repetitive losses totaling $264,797 in insurance claims for one RL property have been recorded in the Town of Brownville in Jefferson

County. At this time, no RL properties have been verified in the remaining communities of the Chaumont-Perch Watershed. 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 Chaumont-Perch Watershed.

Table 17: Repetitive Losses in Study Area (as of May 2015)

Community	Number of Losses	Total Claims Paid
Brownville, Town of	2	$264,797
Cape Vincent, Town of	0	$0
Chaumont, Village of	0	$0
Clayton, Town of	0	$0
Henderson, Town of	0	$0
Hounsfield, Town of	0	$0
Lyme, Town of	0	$0
Orleans, Town of	0	$0
Pamelia, Town of	0	$0
Sackets Harbor, Village of	0	$0
Watertown, City of	0	$0
Watertown, Town of	0	$0
Total	**2**	**$264,797**

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 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 Chaumont-Perch 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.

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 18: FIS Historical Flooding Areas

Community	Event Date	Areas of Concern
Brownville, Town of	N/A	No published information available.
Cape Vincent, Town of	N/A	No published information available.
Chaumont, Village of	N/A	No published information available.
Clayton, Town of	N/A	No published information available.
Henderson, Town of	Various	Flooding within the town occurs behind the seawalls on Lake Ontario at the hamlets known as Flat Rock and Wind Swept Shores along the town's northern shoreline. The most severe flooding from overflow occurs at Stoney Creek during the spring thaw.
Hounsfield, Town of	N/A	No published information available.
Lyme, Town of	N/A	No published information available.
Orleans, Town of	N/A	No published information available.
Pamelia, Town of	February 1985	Kelsey Creek flooded in February 1985, causing damage to the community. The flooding along the creek occurs because of its small channel capacity.
Sackets Harbor, Village of	N/A	No published information available.
Watertown, City of	February, 1985	Kelsey and Cold Creeks flooded in February 1985. The flooding along both streams occurs because of their small channel capacities. The undersized culvert at the high railroad embankment near the mouth of Kelsey Creek also affects flood heights upstream from the railroad.
Watertown, Town of	N/A	No published information available.

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*.

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

Table 19: Hazard Mitigation Plan Significant Flood Events

Community	Flood Events of Significance
Brownville, Town of	Did Not Participate in County Plan
Cape Vincent, Town of	Did Not Participate in County Plan
Chaumont, Village of	No Village specific events included
Clayton, Town of	No Town specific events included
Henderson, Town of	No Town specific events included
Hounsfield, Town of	No Town specific events included
Lyme, Town of	No Town specific events included
Orleans, Town of	Did Not Participate in County Plan
Pamelia, Town of	Did Not Participate in County Plan
Sackets Harbor, Village of	No Village specific events included
Watertown, City of Watertown, City of (Cont'd)	September 27, 1975: 5 inches of rain fell over a 3-day period causing sewers to overflow and basements, streets, and schools to flood. March 14, 1977: Deep snowpack, warm temperatures, and heavy rain caused the largest flood on record (at the time) for the Black River. February 1985: Small channel capacities caused flooding around Kelsey and Cold Creeks. March 20, 1998: Rapid snowmelt and rain caused the Black River to exceed flood stage leading to lowland flooding. Event damages $50,000. April 15, 2002: Heavy rains and snowmelt caused the Black River to rise to its stream banks, flooding agricultural lands. Event damages $10,000.
Watertown, Town of	Did Not Participate in County Plan

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 remnant 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 Table 20: *Disaster Declarations*. Since 1972 there have been three flood-related declared disasters within the study area. FEMA's disaster and emergency declarations history can be viewed at FEMA's website.

Table 20: Disaster Declarations (as of August 2013)

Date	Title of Event	Number of Counties Declared within Study Area
March 1973	New York High Winds, Wave Action, Flooding	1
January 1996	New York Severe Storms/Flooding	1
May & June 2004	New York Severe Storms and Flooding	1

During the Discovery meetings, several community officials noted significant flood events that caused significant flooding in their communities. The Town of Clayton in Jefferson County has significant flooding at the Route 12 Bridge in Depauville over the Chaumont River. The river floods up to and over the bridge. Ice must be broken every spring in that location or floods will occur further upstream.

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 the USGS or USACE prior to the Discovery Meeting. During the pre-Discovery and Discovery Meetings, communities were asked about additional known HWMs. No specific details were provided for the HWMs noted by the communities within the Chaumont-Perch Watershed.

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:

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.

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 Sandy Creek in the Town of Adams and the Oswegathice River in the City and Town of Watertown. The complete list with fuller descriptions of the circumstances of jamming at each location can be found on the USACE website: http://icejams.crrel.usace.army.mil/

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

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. 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 Table 21: *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 21: Approved Hazard Mitigation Plans (as of June 2013)

Community	Approval Date	Plan Expiration
Brownville, Town of	Did Not Participate in County Plan	
Cape Vincent, Town of	Did Not Participate in County Plan	
Chaumont, Village of	1/4/2011	1/4/2016
Clayton, Town of	1/4/2011	1/4/2016
Henderson, Town of	1/4/2011	1/4/2016
Hounsfield, Town of	1/4/2011	1/4/2016
Lyme, Town of	1/4/2011	1/4/2016
Orleans, Town of	Did Not Participate in County Plan	
Pamelia, Town of	Did Not Participate in County Plan	
Sackets Harbor, Village of	1/4/2011	1/4/2016
Watertown, City of	1/4/2011	1/4/2016
Watertown, Town of	Did Not Participate in County Plan	

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.

Table 22: *Critical Facilities and Infrastructure at risk of Flooding in the Chaumont-Perch 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.

Table 22: Critical Facilities and Infrastructure noted in HMP as at risk of Flooding in the Chaumont-Perch Watershed (as of June 2013)

Community	Facilities Located within SFHA
Brownville, Town of	Did Not Participate in County Plan
Cape Vincent, Town of	Did Not Participate in County Plan
Chaumont, Village of	None
Clayton, Town of	None
Henderson, Town of	None
Hounsfield, Town of	None
Lyme, Town of	None
Orleans, Town of	Did Not Participate in County Plan
Pamelia, Town of	Did Not Participate in County Plan
Sackets Harbor, Village of	None
Watertown, City of	1 EMS station (Guifoyle Ambulance), 1 school (Jefferson County Community College)
Watertown, Town of	Did Not Participate in County Plan

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.

Jefferson County communities included a diverse mitigation strategy for expanding GIS capabilities, storm sewer maintenance, public notification for hazard events, and public education. The City of Watertown included mitigation actions related to storm sewer installation, repair and maintenance, and expanding their GIS services to citizens.

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

Guidance for local officials on complying with State and Federal stormwater management requirements, Minimum Measures 4 and 5, can be found on the NYSDEC's website.

There are no MS4 permits issued in the Chaumont-Perch Watershed.

Detailed maps that depict where the regulated MS4 boundaries lie can be found on the NYSDEC's website.

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: What changes to vegetation or land use have occurred in the area?
- Coastal Dune: Is there a failure to identify primary frontal dune in coastal areas?
- High Water Mark: Have significant storms occurred with recorded HWMs?
- Regression Equation: Are new regression equations available?

CNMS is a living database that is continuously updated whenever new or revised studies become available. As part of that update, valid stream reaches will be reassessed every 5 years and invalid streams will be prioritized for potential funding. Watershed Discovery meetings will 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 23: *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 23: Current Status of CNMS (as of August 2013)

County	FIPS	Stream Mileage Within Chaumont-Perch Watershed		
		Valid	Unverified	Total
Jefferson	36011	0	103.58	103.58

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.

Table 25: *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. Approximately 30 percent of the communities within the Chaumont-Perch Watershed provided needs that have been captured in CNMS. 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 Chaumont-Perch 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*)

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_OntarioWatershed_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. Table 24: *Community Meeting Information* includes meeting dates and locations for the 10 in-person meetings held during Discovery.

Table 24: 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 Chaumont-Perch Watershed, the in-person meetings were held on Thursday, November 14, 2013, at 9:30AM and 2:00PM. 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:

- Jefferson County;
- Town of Cape Vincent;
- Town of Clayton;
- Village of Chaumont;
- Town of Henderson;
- Town of Lyme;

- Town of Pamelia;
- City of Watertown.

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

Table 25: *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.

Jefferson County is experiencing increased development and the current paper FIRMs are perceived as difficult to use for interpretation and determinations. Most communities within Jefferson County do not have digital floodplain products and the current paper maps have no BFEs established. The Town of Orleans still relies on its original maps from 1978. Jefferson County is currently experiencing increased development, especially waterfront development. The current paper FIRMs are perceived as difficult to use for interpretation and determinations and have limited legibility. At a minimum, digital products would assist the communities with their floodplain management.

Five communities that submitted Data Worksheets noted a need for additional training related to floodplain management and hazard mitigation.

Table 25: Summary of Community Floodplain Mapping Needs

Community (All located in Jefferson County)	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
Brownville, Town of	6/2/1992	No	Paper	No data gathered from Community due to lack of participation.					
Cape Vincent, Town of	6/2/1992	Yes	Paper	Yes	No	No	Yes	Yes	- Recurrent flooding in low areas along Lake - Development in Mud Bay
Chaumont, Village of	9/8/1999	Yes	Paper	Yes	No	Yes	No	Yes	- Horseshoe Creek has significant erosion - Development along Chaumont River - NYSDEC scoping notes include properties damaged in 1973, 1974, and 1979 along Lake Ontario
Clayton, Town of	4/2/1986	Yes	Paper	Yes	No	No	No	Engineering Rep	- Waterfront development as part of joint Local Waterfront Revitalization program. - Serious problems noted with FIRMs - NYSDEC community notes include serious problems noted with the flood maps - Shoreline properties and buildings are undergoing upgrades.
Henderson, Town of	5/18/1992	Yes	Paper	Yes	No	Yes	Yes	Yes	- Need more detailed maps to determine if structure is in or out of SFHA - Waterfront development - Bridge replacement -NYSDEC community file notes area designated as CEHA current BFE at 249.0 NGVD and ACE Coast Flood Level Report is significantly higher. A restudy with wind/wave runup is needed.

Community (All located in Jefferson County)	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
Hounsfield, Town of	5/18/1992	Yes	Paper	Yes	No	Yes	Yes	No	- High priority for detailed digital maps
Lyme, Town of	9/2/1993	Yes	Paper	Yes	No	Yes	No	Yes	- Ice jams along Three Mile Creek - DEC wetland project developed ponds in wildlife refuge (2012) - Residential development in Town - Erosion and flooding along shoreline
Orleans, Town of	3/1/1978	Yes	Paper	Yes	No	N/A	No	No	- Seven rural sites within the Town have flooding and development along Bedford Creek, Chaumont River, Gillette Creek, Horse Creek, Kents Creek, Mill Creek, Parish Creek, Perch River, Stone Mills Creek, and Three Mile Creek
Pamelia, Town of	1/2/1992	Yes	Paper	Yes	No	Yes	No	Yes	- Boundary changes - Culverts have decreased flooding - Commercial development - NYSDEC community file includes study for reach of Philomel Creek (Bernier Carr and Associates) Special Flood Hazard Evaluation Report from 1985 for Kelsey and Cold Creeks Buffalo District USACE
Sackets Harbor, Village of	5/2/1994	No	Paper	No data gathered from Community due to lack of participation. Jefferson County noted significant growth in the Village. Information captured in CNMS.					
Watertown, City of	1/17/1990 and 8/2/1993	Yes	Paper	Yes	No	No	Yes	Yes	- Flooding of the Black River throughout City- need restudy and BFEs - Boundary changes -Bridge replacements post FIRMs have created problematic flows
Watertown, Town of	8/2/1993	No	Paper	No data gathered from Community due to lack of participation					

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.

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

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,

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 8explains the LiMWA zone location.

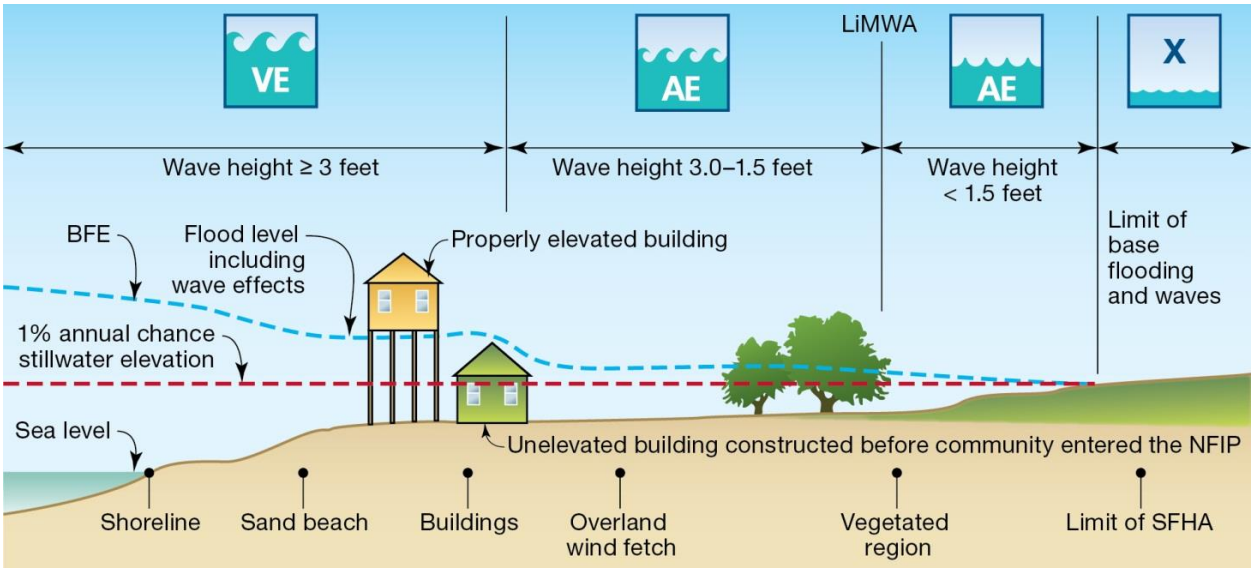

Figure 8: Limit of Moderate Wave Action

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.

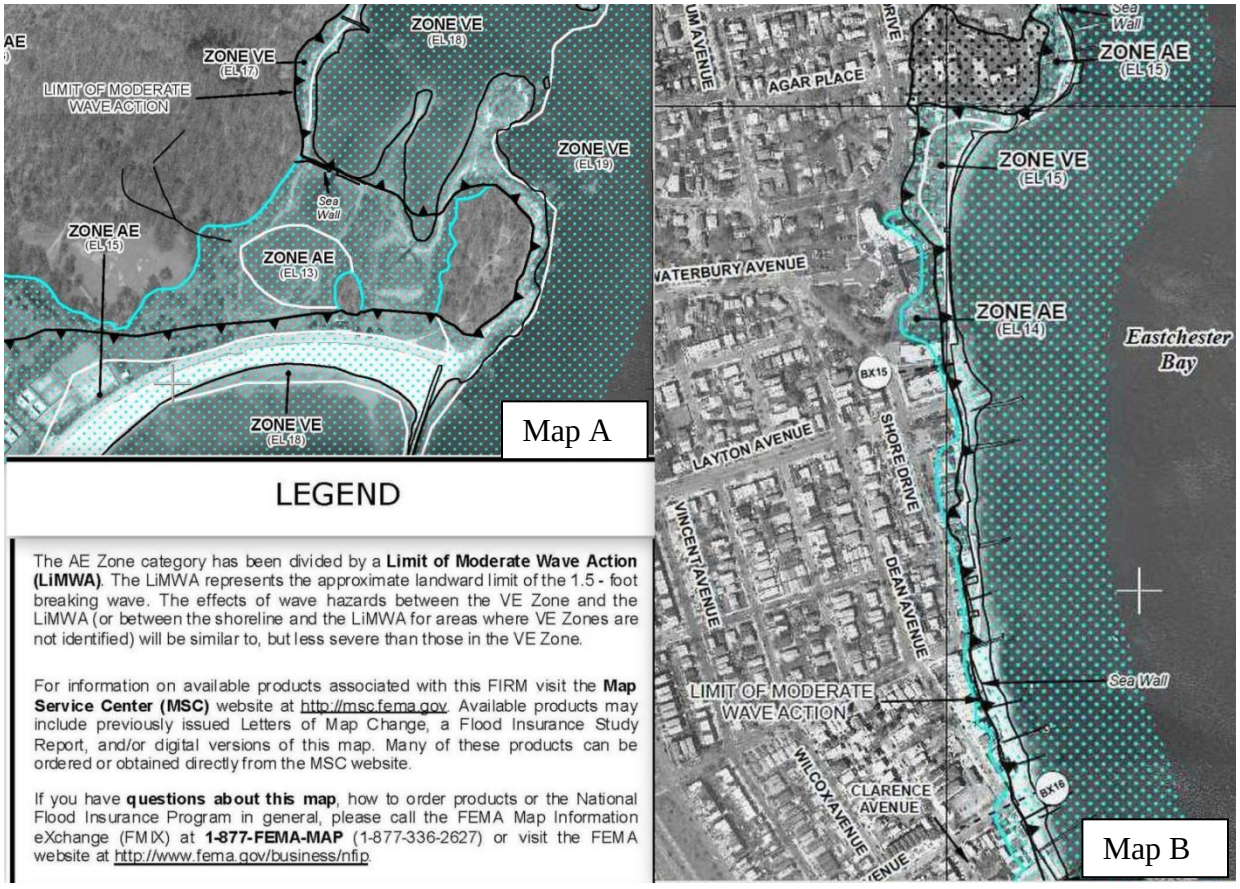

Figure 9: Example FIRM showing LiMWA

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. Most of the communities in Jefferson County and the Chaumont-Perch Watershed do not have digital maps and often the information depicted on the paper maps is not current. This makes mitigation actions and floodplain management difficult for those community officials.

As noted in Table 25: *Summary of Community Floodplain Mapping Needs*, municipalities within Jefferson County 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

Most communities within the Chaumont-Perch Watershed do not have digital floodplain products. 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. The quality of the available flood data and lack of digital products makes floodplain management and mitigation difficult. Continued vigilance must be maintained so that as the economy improves, good building practices continue for communities within the watershed.

Stream extents that have consistently been discussed as priority needs (as shown in Table 25: *Summary of Community Floodplain Mapping Needs*) and warrant updated studies include Mud Bay, Chaumont River, Three Mile Creek, Philomel Creek, and Horseshoe Creek. Additional extents with significant AAL expected damages include Mill Creek, Bedford Creek, Perch River, and Horse Creek. NYSDEC has reviewed all of the data and stream study priorities provided as part of the Discovery process and developed a recommended scope of work for each of the eight watersheds within the Lake Ontario Discovery project area. See Appendix O: *Chaumont-Perch 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 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 and efforts or working on a countywide-basis to ease the effort of complying with the requirements of joining the CRS program (e.g., Jefferson County).

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, and the more restrictive State Building Codes, apply to all construction in the SFHA. Information on the NFIP's building requirements in the SFHA can be found in the NYSDEC's *Floodplain Construction Requirements in New York State*.

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

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 the100-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.

Page 2

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.

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August 2011 www.fema.gov/plan/prevent/fhm/rm_main.shtm · 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 provided 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.
- For additional information on NFIP criteria for accrediting levees, visit: 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.
- For more specific information regarding levee construction and restoration, visit: 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.

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

FEMA

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.

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/frm_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.

FLOOD

INSURANCE

HAZUS

HURRICANE

DAMS/LEVEES

PLANNING

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. 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/frm_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.

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/frm_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 maintaining 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.

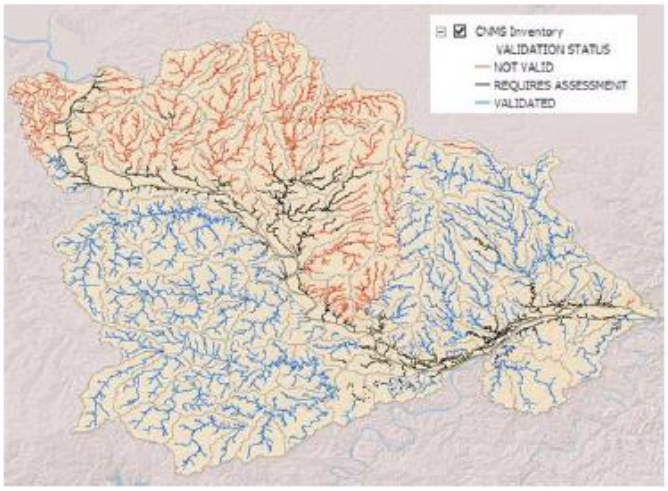
Additional Information

- 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

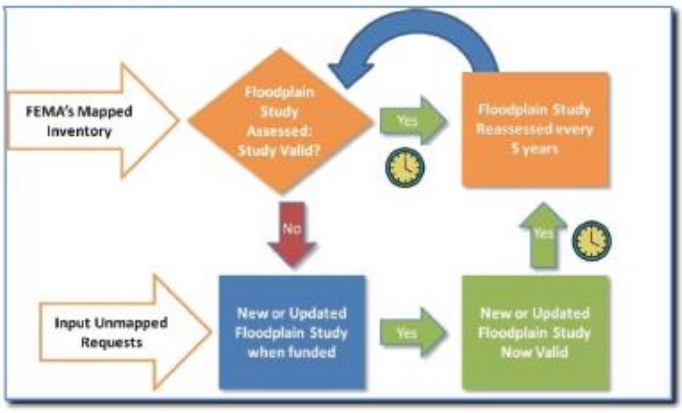
March 2011 www.fema.gov/plan/prevent/fhm/rm_main.shtm · 1-877-FEMA MAP

Tracking of Engineering Analyses



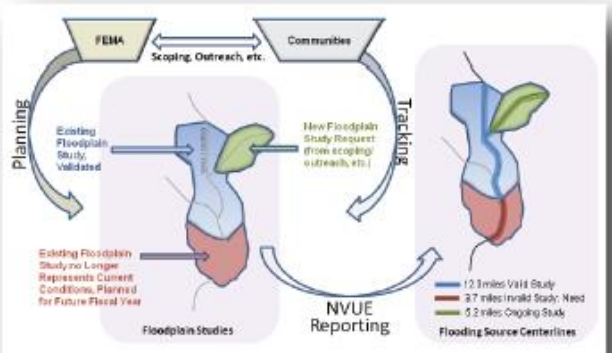
One of the goals of CNMS is to assess the validity of engineering study data through a series of triage checks. The engineering study validation process evaluates whether or not there is an adequate level of flood hazard risk identified on a community's FIRM. The process evaluates the existing floodplain 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.



CNMS: FEMA's Inventory of Floodplain Studies