

Discovery Report

Lake Erie Buffalo-Eighteenmile Watershed

HUC 04120103

Erie, Genesee, and Wyoming Counties, New York*

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

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FEMA

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Project Area Community List

This list includes all communities located fully or partially within the Buffalo-Eighteenmile Watershed, and as a result included in this Discovery project. 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), not all communities will receive new/updated FEMA FISs or FIRMs as a result of this study.

Erie County

Alden, Town of*
Angola, Village of
Aurora, Town of
Blasdell, Village of
Boston, Town of
Brant, Town of*
Buffalo, City of*
Cheektowaga, Town of*
Colden, Town of
Collins, Town of*
Concord, Town of*
Depew, Village of*
East Aurora, Village of
Eden, Town of
Elma, Town of
Evans, Town of
Farnham, Village of
Hamburg, Town of
Hamburg, Village of
Holland, Town of

Erie County (Continued)

Lackawanna, City of
Lancaster, Town of*
Lancaster, Village of*
Marilla, Town of
North Collins, Town of*
North Collins, Village of*
Orchard Park, Town of
Orchard Park, Village of
Sardinia, Town of*
Sloan, Village of
Wales, Town of
West Seneca, Town of

Genesee County

Darien, Town of*

Wyoming County

Arcade, Town of*
Bennington, Town of*
Java, Town of*
Sheldon, Town of*

**Partially within the Buffalo-Eighteenmile Watershed*

Study Date

The information and data presented in this report is static and was current as October 2014, the date of initial submission.

For the Buffalo-Eighteenmile Watershed, the Discovery process began in the spring of 2014. Data collection, as detailed in Section V, was completed in August 2014. The in-person meetings were held on June 10th and 11th 2014. Additional details on meetings and stakeholder involvement can be found in Section IV of this report. Data collected in this report was available prior to August 2014. As applicable, dates of data creation are noted throughout the report.

Executive Summary

The Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program helps communities identify, evaluate, and reduce their flood risk. FEMA, in coordination with the New York State Department of Environmental Conservation (NYSDEC), has completed Discovery, the first step in the Risk MAP process, for three Lake Erie watersheds. This report describes the Discovery process and results for the Buffalo-Eighteenmile Watershed.

Discovery is a process that helps communities identify risks and sustainable development methods and provides participants with an in-depth understanding of their watershed. The process involves conducting an assessment of existing flood hazard mapping needs throughout a watershed, and researching available information that may be of use to update Flood Insurance Rate Maps (FIRMs). In partnership with state and local officials, FEMA uses recommendations identified through the Discovery process to refine existing Risk MAP and FIRM products, as needed.

The basic structure of the Discovery Report follows a standard template to allow comparison between watersheds. This Discovery Report also summarizes FEMA's ongoing Great Lakes Coastal Flood Study (GLCFS). The GLCFS is a comprehensive study of coastal flood hazards for the shoreline along the Great Lakes Basin. The study is being performed by FEMA in cooperation with the U.S. Army Corps of Engineers (USACE), the Association of State Floodplain Managers, and other partners.

The Discovery process for the Lake Erie watersheds involved extensive basin-wide data collection and outreach efforts with stakeholders in each 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 H: *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 Buffalo-Eighteenmile Watershed. A record of meeting participants can be found in Appendix I: *Pre-Discovery Stakeholder Meetings* and a summary of the information collected can be found in Appendix J: *Kickoff Meeting Notes*.

Watershed stakeholders were encouraged to attend Discovery meetings to become engaged in the process. Discovery meetings were held on June 10, 2014 in Blasdell, New York for Erie and Genesee counties and on June 11, 2014 in Springville, New York for Wyoming County. All relevant flood-related information was reviewed during these meetings. The meetings also allowed participants to discuss the watershed's future, and learn about the importance of mitigation planning and community outreach.

As a result of the Buffalo-Eighteenmile Discovery process, FEMA and NYSDEC, with the assistance of watershed stakeholders, identified needs (Table 25: *Summary of Community Floodplain Mapping Needs*) and priorities (Table 26: *Summary of Community Priorities*) relating to specific flooding sources within the watershed. By obtaining a better understanding of existing local risk and mitigation actions already underway, FEMA was able to begin working with communities to identify new ways to take action to reduce flood risk and strengthen existing actions. During this project, multiple stakeholders noted a need for additional floodplain management and hazard mitigation training. Table 27 summarizes the training needs that were noted during Discovery. The Community Rating System (CRS) was also identified as a program that would be of benefit to communities in the watershed. Training towards CRS objectives, and best practices about joining the program would serve to further flood risk mitigation within, and protection of the natural floodplain for watershed communities.

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

Appendices

- Appendix A: *Acronyms and Abbreviations*
- Appendix B: *Glossary of Terms*
- Appendix C: *Other Stakeholders in the Buffalo-Eighteenmile Watershed*
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I. Lake Erie Watershed Discovery Project Overview

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

Discovery is the first phase of the Risk MAP process. Prior to Discovery, a watershed is 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. For a complete picture of a community's flood risk, FEMA relies heavily on information and data provided by the community itself.

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 the Lake Erie Watershed Discovery project, FEMA, NYSDEC, and partners:

- Gathered information about local flood risk and flood hazards;
- Reviewed mitigation plans to understand local mitigation capabilities, hazard risk assessments, and current or future mitigation activities;
- Supported communities within the watershed to develop a vision for the watershed's future;
- Collected information from communities about their flooding history, effective Flood Insurance Rate Map (FIRM) usability, development plans, daily operations, and stormwater and floodplain management activities;
- Used 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
- Developed a Discovery Map and Report that summarize and display the Discovery findings.

For definitions of terms and acronyms used throughout this Discovery report, refer to Appendix A: *Acronyms and Abbreviations* and Appendix B: *Glossary of Terms*.

Figure 1 provides an overview of the watersheds that have been included within the Lake Erie Discovery project. Three individual watershed Discovery reports have been concurrently developed and include 6 counties, one tribal community, and 81 individual communities. The Buffalo-Eighteenmile Watershed is shown in green in Figure 1.

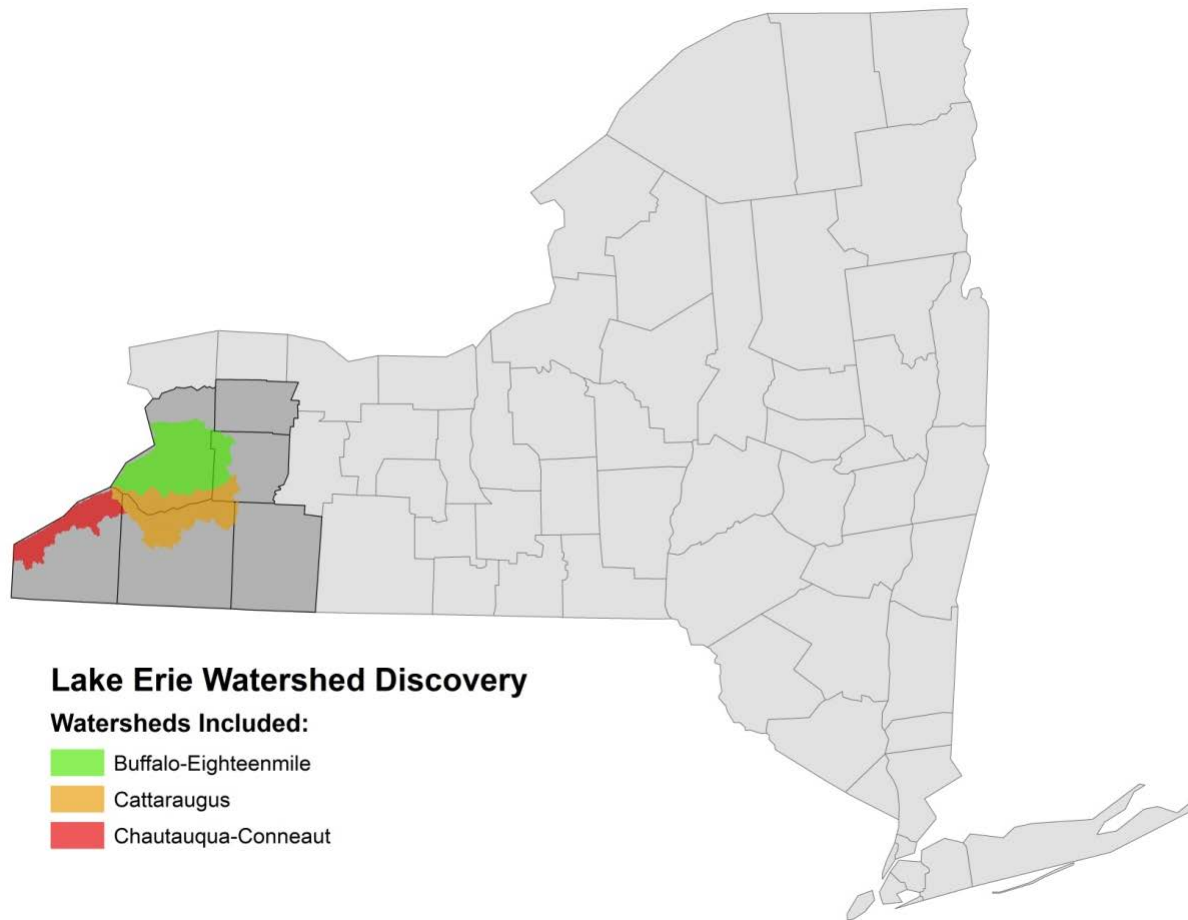


Figure 1: Lake Erie Watershed Discovery

Prior to the beginning of this Discovery project, FEMA had initiated a coastal analysis re-study for Lake Erie as part of a system-wide Great Lakes flood study. Additional details about that study are provided in the section below.

Great Lakes Coastal Flood Study

The current, effective FIRMs for the communities surrounding the Great Lakes are outdated in terms of age and the methodologies used in the coastal analysis used to produce them. There have been major changes to NFIP policies and updates to the FEMA guidelines and standards used to complete coastal flood studies since the effective date of many of the area's Flood Insurance Studies (FISs).

FEMA shows VE zones on FIRMs to designate areas that are at greater 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 to date, VE Zones have not been mapped along the Great Lakes shorelines. Because the types of major storm events that impact the Great Lakes region are different when compared to those that impact other U.S. shorelines,

an independent body was convened to evaluate whether VE Zones were appropriate designations in the Great Lakes. This study was completed in early 2015 and did conclude that VE Zones are appropriate along the Great Lakes shorelines.

FEMA initiated the Great Lakes Coastal Flood Study (GLCFS) to evaluate the surge and wave hazards, as well as evaluate the mapping needs. The goal of the GLCFS was to update the coastal flood hazard information for Great Lakes coastal communities and help elevate risk awareness and stimulate mitigation actions in the region. The GLCFS was funded through the FEMA Risk MAP program. FEMA, the Association of State Floodplain Managers (ASFPM), State partners and FEMA contractors will collaborate in updating the coastal methodology and flood maps, as needed.

The Great Lakes is a hydraulic system best studied as an integrated system where related information is included in each separate lake study. As a result, the study will include a system-wide solution that provides a comprehensive analysis of past storm events. As part of the study, a revised coastal flood hazard analysis including a comprehensive storm surge study and overland wave analysis will be completed and coastal hazard work maps will be produced. The results of the study, along with the needs of the communities as identified during the Discovery process, will determine whether updated FIRMs will be produced as part of the GLCFS.

Other Flood Studies

In addition to the GLCFS and corresponding work map production, a number of risk analysis and flood mapping efforts are underway in the watersheds within Erie County.

In 2008, a partial countywide FIS and FIRM became effective for Erie County that provided updated flood hazard information for Cazenovia Creek and portions of the Buffalo River. The communities affected by the release of that FIS and FIRM were limited to the cities of Buffalo and Tonawanda; towns of Collins, Grand Island, Holland, and Wales; and villages of Gowanda and Williamsville.

In late 2009, FEMA released a comprehensive countywide preliminary FIS and FIRM affecting all communities within the county for review. That FIS and FIRM reflected updated flood hazard information for over twenty flooding sources in the county. However, processing of the preliminary FIS and FIRM was placed on hold when FEMA implemented updated Levee Analysis and Mapping Procedures (LAMP) for areas that have not been demonstrated to meet the requirements in the NFIP regulations related to a levee system's capacity to provide 1-percent-annual-chance flood protection. These regulations are found in the Code of Federal Regulations (CFR) at Title 44, Chapter 1, Section 65.10 (44 CFR§65.10). Through LAMP, FEMA recognizes that levee systems that do not fully meet the requirements set forth in 44 CFR §65.10 may still provide a measure of flood risk reduction. For this reason, the agency has developed a suite of procedures for providing a more refined depiction of flood risks.

In 2016, FEMA is continuing the map update process for Erie County through release of a revised preliminary countywide FIS and FIRM. The revised preliminary FIS and FIRM will take into account that the Cayuga Creek right bank levees and floodwall, Cayuga Creek left bank levee

and floodwall, and Ellicott Creek Flood Control Project at the Amherst Levee are non-accredited levee systems (i.e., the levee systems are not in compliance with the levee requirements described in 44 CFR §65.10).

To allow for the continued processing of the countywide FIS and FIRM, FEMA will use an approach known as seclusion. This approach will result in the flood hazard information in areas affected by levees and floodwalls within the towns of Amherst and Cheektowaga and the villages of Depew and Lancaster, remaining as shown on the current effective FIS and FIRM for each community.

Concurrent with the processing of the countywide FIS and FIRM, FEMA Region II will be undertaking LAMP projects with the United States Army Corps of Engineers (USACE), Buffalo District, NYSDEC, the towns of Amherst and Cheektowaga and the villages of Depew and Lancaster to understand and assess the flood risk related to these local levee systems. LAMP is being applied to the levee impacted areas along Cayuga Creek in the villages of Depew and Lancaster (Figure 2) along Ellicott Creek in the Town of Amherst (Figure 3) and along a portion of Cayuga Creek in the Town of Cheektowaga (Figure 4).

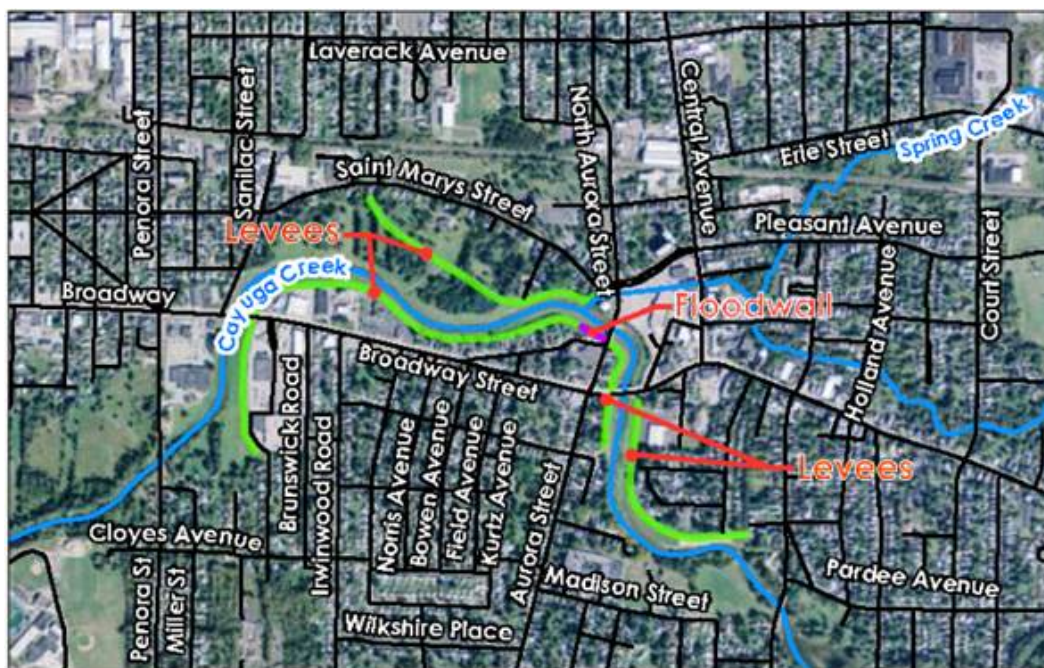


Figure 2: Cayuga Creek Right Bank Levees and Floodwall and Cayuga Creek Left Bank Levee and Floodwall



Figure 3: Ellicott Creek Flood Control Project at Amherst Levee

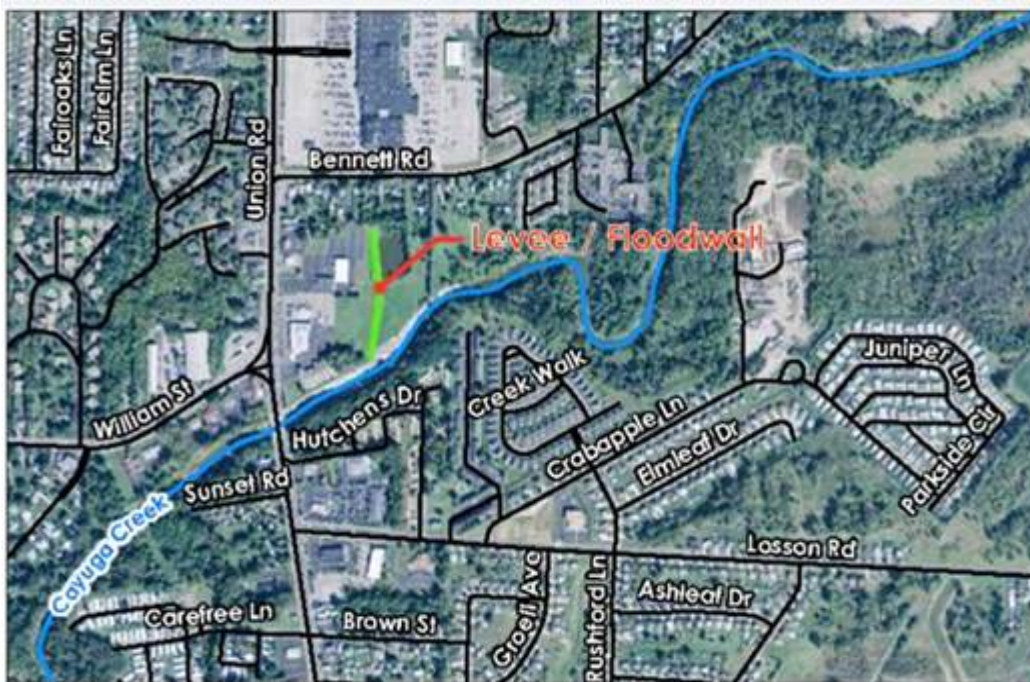


Figure 4: Levee and Floodwall system on Cayuga Creek in the Town of Cheektowaga

As part of the LAMP process which will be undertaken in the affected communities, a Local Levee Partnership Team (LLPT) was formed during the first LAMP meeting. An LLPT is a collaborative work group comprised of key stakeholders in the community responsible for providing feedback and additional data about the levees. In collaboration with the LLPT and affected communities, FEMA will develop analyses and map the flood hazards related to the levees using one of the LAMP methods. Information on each of the five mapping methods - [Natural Valley](#), [Overtopping](#), [Structural-Based Inundation](#), [Sound Reach](#), and [Freeboard Deficient](#), as well as other useful resources can be found on FEMA's [Final Levee Analysis and Mapping Approach](#) website.

At the completion of Phase 3 of the project, FEMA will initiate a follow-up map revision to the countywide FIS and FIRM to incorporate the LAMP results.

No flood study updates or LAMP projects are underway within Genesee or Wyoming Counties.

Stakeholder Coordination

To begin this effort, [NYSDEC](#)'s Floodplain Management Section along with Risk Assessment, Mapping, and Planning Partners [a joint venture between Dewberry, URS (now AECOM) and ESP] (RAMPP) 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 online WebEx™-based discussions. The purpose of these WebEx™ sessions was to introduce the planning team, request feedback from the municipalities, counties, and regional groups within the project area, determine what additional local floodplain and hazard risk data were available, and determine who to include in the Discovery process. To further expand on this discussion, participants were asked to complete and return community data worksheets to supplement the discussion.

This initial contact was followed by in-person Discovery meetings held on June 10, 2014 in Blasdel, New York for Erie and Genesee counties and on June 11, 2014 in Springville, New York for Wyoming County. All relevant flood-related information was reviewed during these meetings. The meetings also allowed participants to discuss the watershed's future, and learn about the importance of mitigation planning and community outreach. Detailed information about the Discovery meetings is provided in Section IV of this report.

Other Stakeholders

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

An attempt to identify all relevant stakeholders in the watershed was made. The resulting list is shown in Appendix C: *Other Stakeholders in the Buffalo-Eighteenmile Watershed*.

Communication

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

II. Buffalo-Eighteenmile Watershed Overview

Geography

The Buffalo-Eighteenmile Watershed is located on the western edge of New York State along Lake Erie. The watershed occupies 458,699 acres, or 716.7 square miles in land area and ranges in elevation from 567 to 1,942 feet above sea level. The higher elevations tend to be in the southern and eastern portions of the watershed. As shown in Figure 5: *Buffalo-Eighteenmile Watershed Communities*, portions of Erie, Genesee and Wyoming counties lie within the watershed.

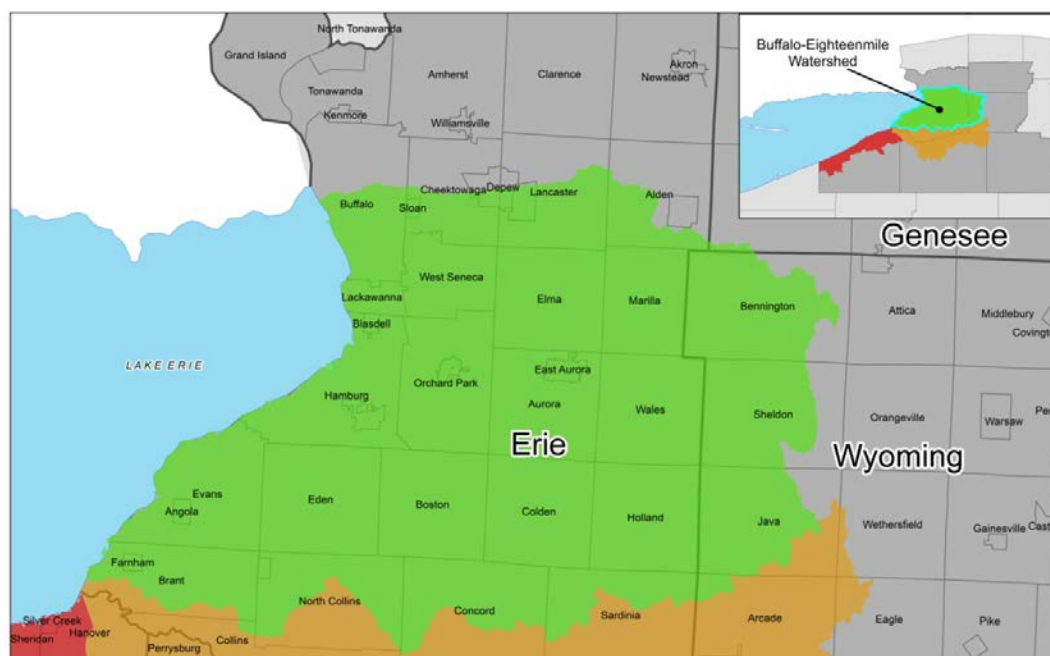


Figure 5: Buffalo-Eighteenmile Watershed Communities

Property Ownership

Land ownership in the watershed is diverse. Urban areas make up 24 percent of the watershed and include Buffalo and suburbs south and east of the city. Agriculture is spread evenly across the watershed. There are approximately 850 farms in the watershed and most of the operations are small to medium sized. Most farm operations raise some livestock with horses, beef cows

and milk cows rounding out the top three. Dry hay and haylage are the predominate crops, followed by corn for silage, then corn for grain ([USDA](#)).

Erie County is in the western portion of New York State, bordering on the lake of the same name. It is the most populous county in New York State outside of the New York City metropolitan area. Erie County is a major industrial and commercial center in the state. The top 10 largest employers include the State of New York, United State Government, Kaleida Health, State University of New York at Buffalo, Catholic Health Systems, Employer Services Corporation, Tops Market LLC, City of Buffalo Schools, M&T Bank, and the Erie County Government. According to the U.S. Census Bureau, the county has a total area of 1,227 square miles (3,178 km²); of which 1,043 square miles (2,701 km²) is land and 184 square miles (477 km²) (15percent) is water. According to the U.S. Department of Agriculture (USDA) 2007 Census of Agriculture, there are approximately 1,215 farms throughout Erie County consisting of 149,356 acres of farmland.

Genesee County is in the western part of New York State, east of Buffalo and southwest of Rochester. Major employers in the county include educational institutions, government, and manufacturing. Top employers, by number of employees, include Darien Lake Theme Park (seasonal employees), Genesee County Government, United Memorial Medical Center, Genesee Valley Educational Partnership and Genesee Community College. According to the U.S. Census Bureau, the county has a total area of 495 square miles (1,282 km²), of which 493 square miles (1,277 km²) is land and 2.4 square miles (6 km²) (0.5percent) is water. Less than 0.5% of the land area of Genesee County is located within the Buffalo-Eighteenmile watershed. According to the USDA 2007 Census of Agriculture, there are approximately 551 farms throughout Genesee County consisting of 183,539 acres of farmland, all of which are outside of the study area.

Wyoming County is in the western part of New York State, east of Buffalo and slightly west and south of Rochester. The county is in the Holland Purchase Region. Major employers in the county, by number of employees, include American Precision Industry, Wyoming County Government, Pioneer Credit Recovery (A Navient Company), Attica Correctional Facility, Wyoming County Correctional Facility, and Prestolite Electric, Inc. According to the U.S. Census Bureau, the county has a total area of 596 square miles (1,544 km²), of which 593 square miles (1,536 km²) is land and 3.5 square miles (9 km²) (0.6percent) is water. According to the USDA 2007 Census of Agriculture, there are approximately 761 farms throughout Wyoming County consisting of 218,028 acres of farmland, the majority of which are outside of the Buffalo-Eighteenmile Watershed.

The Cattaraugus Reservation is within the watershed and is held and governed as a sovereign territory of the Seneca Nation of Indians. The reservation is primarily located in Erie County. Smaller parts of the reservation are found in Cattaraugus County and Chautauqua County. According to the U.S. Census Bureau, the Indian reservation has a total area of 34.5 square miles (89.1 km²), of which 33.7 square miles (87.3 km²) is land and 0.6 square miles (1.9 km²) is water. Based on 2013 American Community Survey 2014 estimates, 840 housing units are located within the reservation, housing a population of 1,845.

More information on property ownership can be found on each county's Real Property webpage as noted in Table 1.

Table 1: Links to County Real Property Webpages

County Name	Hyperlink to Real Property Webpage
Erie	http://www2.erie.gov/ecrpts/index.php?q=real-property-parcel-search
Genesee	http://www.geneseecounty.oarsystem.com/
Wyoming	http://www.wyomingco.net/real/main.html

Demographics

The Buffalo-Eighteenmile Watershed covers parts of 37 cities, towns, and villages. Erie County is part of the Buffalo-Niagara Falls Metropolitan Statistical Area. Genesee County is part of the Batavia Metropolitan Statistical Area. More than half (58%) of the population of Erie County is within the Buffalo-Eighteenmile Watershed. The distribution of population by county in the watershed can be seen in Table 2: *Approximate 2010 Population in the Buffalo-Eighteenmile Watershed*.

During the in-person Discovery meetings, several communities noted current and future development pressures near flooding sources which have been included in Table 26: *Summary of Community Floodplain Mapping Needs*.

Table 2: Approximate 2010 Population in the Buffalo-Eighteenmile Watershed

County	Total County Population (2010 data)	Percent of County Population in Buffalo-Eighteenmile Watershed	2010 Estimated Population in the Buffalo-Eighteenmile Watershed (Based on % in watershed * Total Population)	Square Miles in Buffalo-Eighteenmile Watershed
Erie	919,040	58%	533,043	601
Genesee	60,079	0.5%	300	113
Wyoming	42,155	19%	8,009	2.7
TOTAL	1,021,274	53%	541,352	716.7

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 comprehensive land-use plan can be a powerful tool to guide the community to increased resilience.

While many of the communities in the watershed do not have comprehensive land use plans, links to the county plans that have been developed are compiled in Table 3: *Links to County Land Use*.

Table 3: Links to County Land Use

County Name	Hyperlink to Land Use Webpage
Erie	http://www2.erie.gov/environment/
Genesee	http://www.co.genesee.ny.us/departments/planning/
Wyoming	http://www.wyomingco.net/econ/main.html

Table 4: *U.S. Census 2010 and USDA Census of Agriculture 2007* summarizes the total population and land area based on the 2010 U.S. Census, and the number of farms and acres of farmland based on the USDA 2007 Census of Agriculture.

Table 4: U.S. Census 2010 and USDA Census of Agriculture 2007

County	Population	Land Area (Square Miles)	Farm Land (Acres)
Erie	919,040	1,227	149,356
Genesee	60,079	495	183,539
Wyoming	42,155	596	218,028

As was noted during the in-person Discovery meetings, growth in the watershed remains subdued for most communities. Construction of new homes and commercial properties continues at a slow pace and largely is in the form of the incremental conversion of summer cottages to year-round residences, and piecemeal, limited-scale housing developments. Despite the slow growth, continued vigilance must be maintained so that as development occurs, sound building practices are in place to protect lives and property within the watershed. Community specific information provided during these meetings has been summarized in Table 25: *Summary of the State of Community Floodplain Mapping* and Table 26: *Summary of Community Floodplain Mapping Needs*.

NFIP Floodplain Development Criteria

When issuing building permits for upgrades to homes located in the Special Flood Hazard Area (SFHA), it is important 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 a 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 New York State building codes and NFIP 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 5 acres, whichever is smaller (44 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.

Municipal Separate Storm Sewer Systems (MS4s)

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

Guidance for local officials on complying with state and federal stormwater management requirements, Minimum Measures 4 and 5, can be found on [NYSDEC’s website. The NYSDEC website also contains detailed maps that depict where the regulated MS4 boundaries lie.](#)

There have been 22 MS4 permits issued (as of 2010) in the Buffalo-Eighteenmile Watershed area—all in Erie County.

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 pre-Discovery interactive mapping webinars with stakeholders and during the in-person Discovery meetings. This section is divided into three parts: data that can be used to develop Risk MAP flood risk products, flood risk and mapping data, and other information that helped the study team to better understand the study area.

Table 5: *Data Collected for the Buffalo-Eighteenmile Watershed*, lists the data products and the respective sources.

Table 5: Data Collected for the Buffalo-Eighteenmile Watershed

Data Types	Source
Average Annualized Loss (AAL) Data	Census 2010 and Hazus-MH
Boundaries: Community	FEMA, NYSDEC
Boundaries: County and State	FEMA, NYSDEC
Boundaries: Watershed	UGS, NYSDEC
Census Blocks	U.S. Census Bureau
Coastal Erosion Hazard Areas (CEHAs)	NYSDEC
Coastal Barrier Resource System (CBRS)	U.S. Fish and Wildlife Service
Contacts	Local websites, State/FEMA updates, NYSDEC
Community Assistance Visits (CAVs)	Community Information System
Community Rating System (CRS)	FEMA’s “Community Rating System Communities and Their Classes”
Coordinated Needs Management System (CNMS)	FEMA
Critical Facilities Vulnerable to Flooding	Local Mitigation Plans

Table 5: Data Collected for the Buffalo-Eighteenmile Watershed

Data Types	Source
Dams and/or Levees	USACE NLD, USACE NID, FEMA MLI, NYSDEC
Declared Disasters	FEMA’s “Disaster Declarations Summary”
Demographics, Industry	U.S. Census Bureau, Hazard Mitigation Plans
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	NYSDHSEM
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, however local knowledge of flooding and mitigation projects is critical to accurately determine flood risks and mapping needs. Therefore, locally and regionally developed data were used where available.

Average Annualized Loss Data (AAL)

The AAL data provides a general understanding of the dollar losses associated with a certain flood event frequency within a county or community and are used to obtain a relative comparison of flood risk. This data 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 building types. The second type of data includes information on the local economy that is used in estimating losses.

The countywide results for the Buffalo-Eighteenmile Watershed were obtained from the report called FEMA Hazus AAL Usability Analysis and are shown in Table 6: *2010 Hazus-MH AAL Data*. AAL data summarized at the census block level are shown on Discovery Maps. AAL data is also available in Appendix D: *FEMA Hazus-MH Average Annualized Loss (AAL)*.

Total losses for the communities included in the Buffalo-Eighteenmile Watershed are estimated at over \$348 billion for AAL. Most of the losses in Erie County occurred in the City of Buffalo and Town of Evans. This also coincides with the number of NFIP policies and claims shown in later sections of this report. All the AAL exposure in the Town of Evans is along the Lake Erie shoreline between Muddy Creek and Fern Brook, and Little Sister Creek and Eighteenmile Creek.

AAL estimates for the City of Buffalo are along the Lake Erie shoreline, the Buffalo River, and Cazenovia Creek.

Table 6: 2010 Hazus-MH AAL Data

County	Community	Building Loss	Contents Loss	Total Loss
Erie	Alden, Town of	\$0	\$0	\$0
	Angola, Village of	\$0	\$0	\$0
	Aurora, Town of	\$0	\$0	\$0
	Blasdell, Village of	\$309,000	\$316,000	\$640,000
	Boston, Town of	\$0	\$0	\$0
	Brant, Town of	\$467,000	\$356,000	\$835,000
	Buffalo, City of	\$102,513,000	\$126,967,000	\$237,954,000
	Cheektowaga Town of	\$3,088,000	\$4,635,000	\$7,996,000
	Colden, Town of	\$0	\$0	\$0
	Collins, Town of	\$0	\$0	\$0
	Concord, Town of	\$0	\$0	\$0
	Depew, Village of	\$0	\$0	\$0
	East Aurora, Village of	\$0	\$0	\$0
	Eden, Town of	\$0	\$0	\$0
	Elma, Town of	\$0	\$0	\$0
	Evans, Town of	\$12,917,000	\$11,495,000	\$24,726,000
	Farnham, Village of	\$0	\$0	\$0
	Hamburg, Town of	\$9,287,000	\$11,355,000	\$21,051,000
	Hamburg, Village of	\$0	\$0	\$0
	Holland, Town of	\$1,000	\$0	\$1,000
	Lackawanna, City of	\$10,874,000	\$17,665,000	\$30,672,000
	Lancaster, Town of	\$0	\$0	\$0
	Lancaster, Village of	\$0	\$0	\$0
	Marilla, Town of	\$0	\$0	\$0
	North Collins, Town of	\$0	\$0	\$0
	North Collins, Village of	\$0	\$0	\$0
	Orchard Park, Town of	\$0	\$0	\$0
	Orchard Park, Village of	\$0	\$0	\$0
	Sardinia, Town of	\$0	\$0	\$0
	Sloan, Village of	\$0	\$0	\$0
	Wales, Town of	\$3,000	\$2,000	\$5,000
	West Seneca, Town of	\$10,430,000	\$10,983,000	\$22,029,000
Genesee	Darien, Town of	\$0	\$0	\$0
Wyoming	Arcade, Town of	\$0	\$0	\$0
	Bennington, Town of	\$864,000	\$556,000	\$1,429,000

Table 6: 2010 Hazus-MH AAL Data

County	Community	Building Loss	Contents Loss	Total Loss
Wyoming (Cont'd)	Java, Town of	\$132,000	\$118,000	\$251,000
	Sheldon, Town of	\$340,000	\$213,000	\$554,000

Source: FEMA HAZUS AAL Usability Analysis 2010

Gage Data

Stream Gages

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. For more information on stream gages, please see the [USGS website](#).

There are five known current and past gages in the watershed and three are active and monitored by the USGS and NYSDEC (Figure 6). Table 7: *USGS Gages in the Buffalo-Eighteenmile Watershed*, shows the gage identification number, active period, location, drainage area, status, and county for all USGS gages identified in the Buffalo-Eighteenmile Watershed. Historical stream flow information from the USGS gages listed in Table 7 will be employed for use in hydrological analysis where applicable.

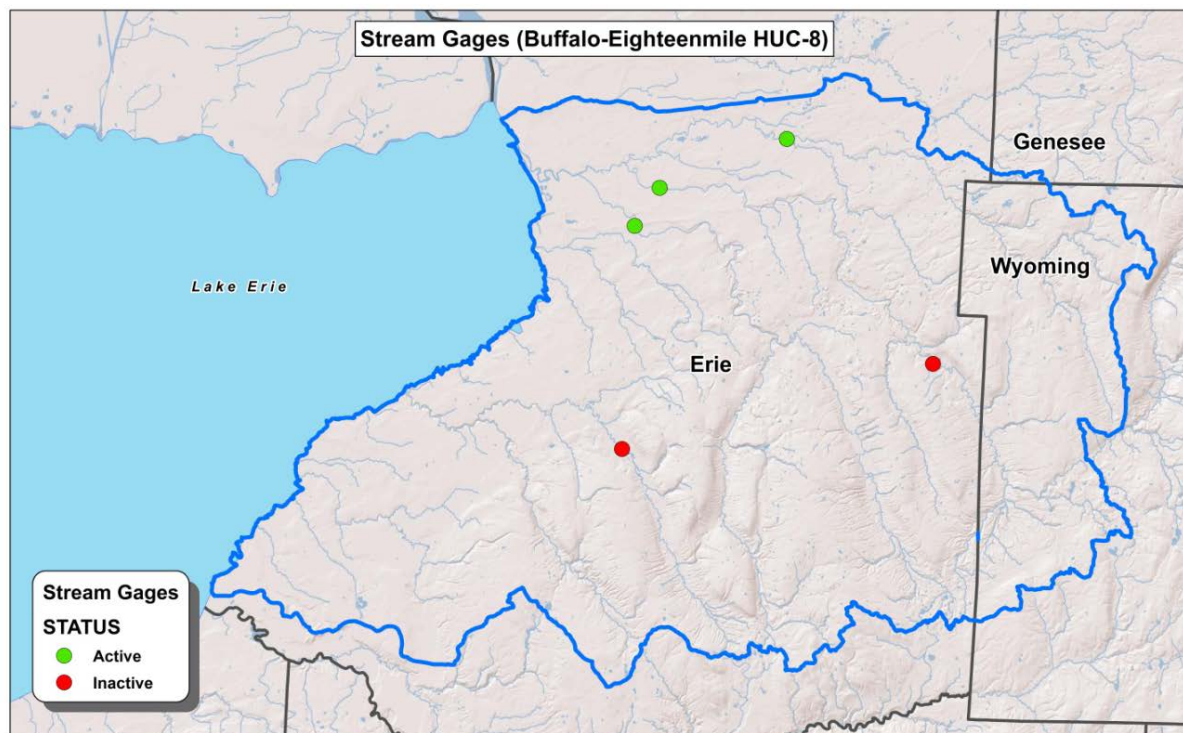


Figure 6: Buffalo-Eighteenmile Watershed Stream Gages

Table 7: USGS Gages in the Buffalo-Eighteenmile Watershed

Gage ID	Active Period	Gage Location	Drainage Area (sq. miles)	Gage Status	County
04214200	1963-1968	Eighteenmile Creek at North Boston, NY	37.2	Inactive	Erie
04214400	1963-1968	Buffalo Creek near Wales Hollow, NY	76.9	Inactive	Erie
04214500	1938-present	Buffalo Creek at Gardenville, NY	142	Active	Erie
04215000	1938 - present	Cayuga Creek near Lancaster, NY	96.4	Active	Erie
04215500	1940 - present	Cazenovia Creek at Ebenezer, NY	135	Active	Erie

Rain Gages

The National Oceanic and Atmospheric Administration's (NOAA) [Cooperative Observer Program](#) is a weather and climate observing network of more than 8,700 volunteers who take observations nationwide on farms, in urban and suburban areas, National Parks, seashores, and mountaintops. Within the three counties of the Buffalo-Eighteenmile Watershed, two locations are currently active. When appropriate, FEMA will utilize the NOAA information from these gages in developing meteorological models for the watershed that will employ rainfall runoff models and calibration.

Additional information on rainfall in New York can be found in NOAA [Technical Paper No. 49](#) and in the Technical Memorandum [NWS HYDRO-35](#), both on NOAA's website. Additional technical manuals and web-based tools including regional extreme rainfall maps and graphics are also available on the NRCS' [Extreme Precipitation in New York and New England website](#).

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). NDBC designs, develops, operates and maintains a United States network of data collecting buoys and coastal stations. Table 8: *NOAA Stations* lists the stations within the Buffalo-Eighteenmile Watershed. These stations provide hourly data, including wind speed, direction, and gust; atmospheric pressure; and air temperature for the gage in the Buffalo-Eighteenmile Watershed. No stations within the Great Lakes provide tidal information, as the tidal range is minimal.

Table 8: NOAA Stations

County	Beginning Date	End Date	Gage Location
Erie	7-11-90	Present	Buffalo (9063020) 42 52.6'N 78 53.4'W
	12-5-89	Present	Sturgeon Point (9063028) 42 41.4'N 79 2.8'W

Levees and Dams

Levees

A levee or floodwall is defined in 44 CFR §59.1 as “a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding”. Levee certification and/or accreditation information can be found in Attachment 3: *Levee Certification vs. Accreditation*.

A review of current and preliminary FIRMs finds that there are four identified levees in the study area, all of which fall within Erie County along Cayuga Creek.

- Town of Cheektowaga on Cayuga Creek (FC_ID 2404000003)
- Villages of Depew and Lancaster on Cayuga Creek (FC_ID 2404000004)
- Village of Lancaster along Cayuga (FC_ID 1204100063 & 2404000005)

Additionally, there is a small levee on Ellicott Creek in the Town of Amherst.

Dams

According to the [NYSDEC's Dam Safety Section](#)'s dam inventory, the Buffalo-Eighteenmile Watershed contains 213 dam structures. The NYSDEC uses a classification scale of A-D and 0 (zero) 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 7: *Dams in Buffalo-Eighteenmile Watershed*.

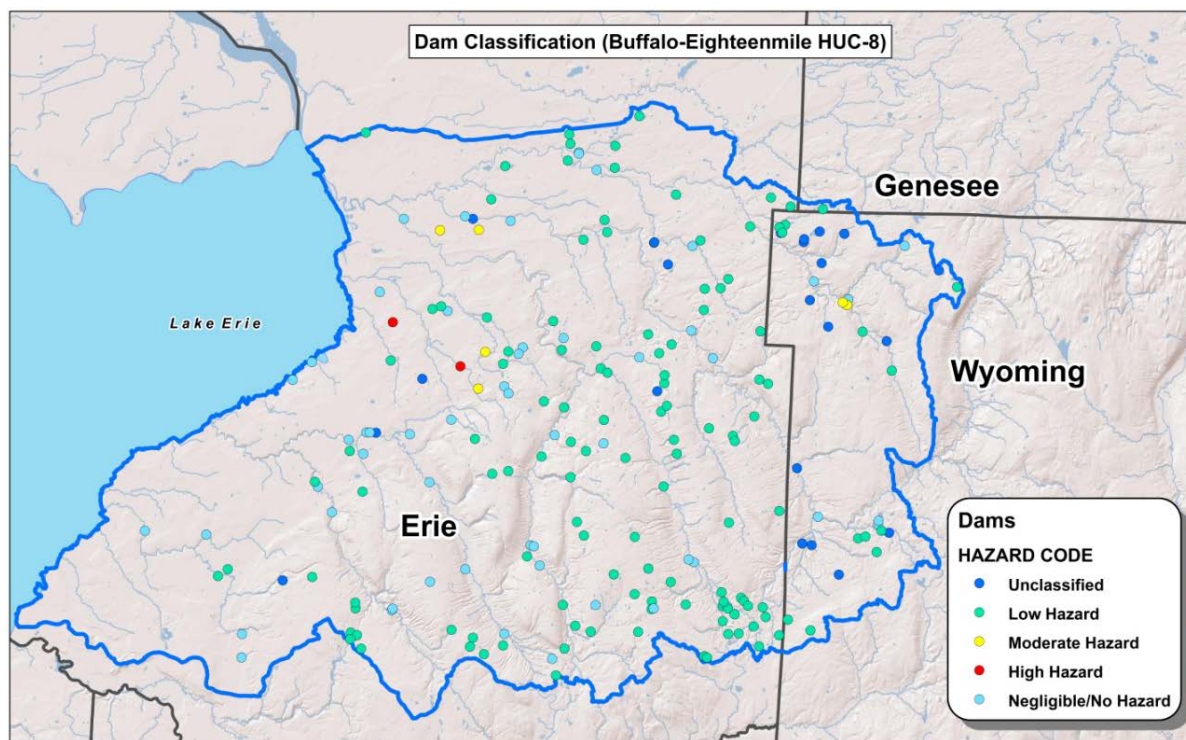


Figure 7: Dams in Buffalo-Eighteenmile Watershed.

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 9: *Dams in the Buffalo-Eighteenmile Watershed* shows the classification of dams located in the Buffalo-Eighteenmile Watershed. According to NYSDEC's Dam Safety Section's dam files, many of the Class B and C dams have reports and studies available. There are 54 Class D dams within the study area and are considered to have no hazard potential. A summary of this information is available in Appendix E: *Dams and Floodplain Structures*. Information includes inspection and certification dates, site plans, analysis (Hydrologic and Hydraulic), As-Built drawings, Emergency Action Plans, applications and permits for maintenance, and correspondence related to each dam.

Table 9: Dams in the Buffalo-Eighteenmile Watershed

County	Class A	Class B	Class C	Class D	Class 0	Total
Erie	115	4	2	48	7	176
Genesee	1	0	0	0	0	1
Wyoming	12	2	0	6	16	36
Total	128	6	2	54	23	213

Streamlines/Hydrograph

Streamlines, when available, were obtained from the effective FIRM databases issued for the communities. Streamlines are a paths made over a period of time that are in line with the direction of velocity and flow of water. 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 components are important to understand the location and severity of floods, forecasting floods, and enabling

communities to plan, mitigate and prevent loss of life and property. For more information, visit the [NOAA website](#).

Topography

Topography is the description of surface features including elevation information. Topographic information can be generated in the form of Light Detection and Ranging (LiDAR) data. LiDAR is a state of the art method for collecting accurate topographic information using an instrument that measures distance to an object by emitting pulses of light using a laser. LiDAR elevation data are available for some portions of the project area at this time; however, there is currently a project ongoing to obtain the remainder of the data. More information on LiDAR data coverage for the State of New York is available at the [GIS.NY.Gov](#) website.

For Erie County, LiDAR from the 2011 USACE Joint Airborne LiDAR Bathymetry Technical Center of Expertise (JALBTCX) and 2008 FEMA New York LiDAR was available. The 2011 USACE topographic dataset has a 2-meter point spacing with a 0.75-meter root-mean-square-error horizontal accuracy and a 20-centimeter root-mean-square-error vertical accuracy, and the 2008 FEMA LiDAR dataset has a 1.4-meter point spacing with a 1 meter root-mean-square-error horizontal accuracy and an 18.5-centimeter root-mean-square-error vertical accuracy.

In addition, the City of Buffalo and Town of Evans in Erie County noted on their community data worksheets that planned collection and/or existing LiDAR data was available. Additional information was not available at the time of data collection on the availability of LiDAR data for other watershed counties.

Bathymetry

[Bathymetry](#) is the underwater equivalent to topography. The data used to make bathymetric maps today typically comes from an echo sounder (sonar) mounted beneath or over the side of a boat, "pinging" a beam of sound downward at the seafloor, or from remote sensing systems. The bathymetry is combined into a seamless Digital Elevation Model (DEM)/terrain and is used to determine the offshore component for the overland wave analysis/coastal hazard analysis and is also a necessary component to study storm surge.

Bathymetric data were compiled from multiple sources to provide complete coverage of the study area. The data sources used to create the bathymetric portion of the terrain are 2011 USACE JALBTCX, 2007 USACE JALBTCX, 1999 U.S. Geological Survey (USGS) National Elevation Dataset (NED) 1/3 arc-second ArcGrid, 1940 and 1980 National Oceanic and Atmospheric Administration (NOAA) National Ocean Service (NOS) Hydrographic Survey Data.

Shoreline Change Information

The Buffalo-Eighteenmile Watershed has approximately 30 mile of shoreline along Lake Erie, contained within Erie 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 Erie 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), per the NYSDEC, for any regulated activity.

Coastal Barrier Resources System

The Coastal Barrier Resources Act (CBRA) of 1982 and (subsequent amendments) established the John H. Chafee Coastal Barrier Resources System (CBRS). The CBRS consists of undeveloped coastal barriers located along the Atlantic, Gulf of Mexico, Great Lakes, U.S. Virgin Islands, and Puerto Rico 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 the local, State and Federal stakeholders to determine sites affected by CBRA at [CBRS Mapper](#).

There are 12.2 miles of CBRS boundaries around Lake Erie. There is one location (0.5 mile of shoreline) in Erie County located in the Town of Evans. Figure 8 shows the location of the CBRS unit in Erie County.

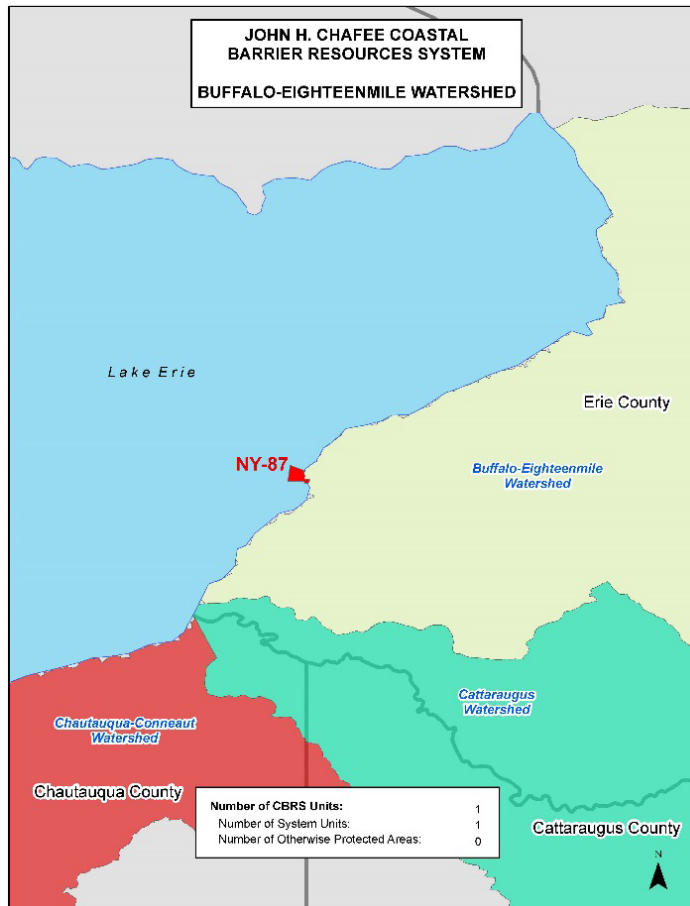


Figure 8: CBRS Units

Coastal Zone Protection Structures

The USACE Enterprise Coastal Inventory Database houses information on over 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, 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 the USACE, Buffalo District. These data have been added to the Discovery Map.

Watershed Boundaries

As described by the USGS, the “United States is divided and sub-divided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique

hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system.”

The Buffalo-Eighteenmile Watershed is a HUC-8 watershed. Figure 9 shows the boundaries of the Buffalo-Eighteenmile Watershed. In decreasing area order (increasing number of digits in the HUC), each is made up by several of the contiguous watersheds of lower hierarchy. The first two digits of the HUC are the code for the Regional Boundary (e.g., 04, for the Great Lakes Region). The next two digits of the HUC are the code for the Sub-regional boundary (e.g., 0412, Eastern Lake Erie). The next two digits are the code for the Accounting Unit (e.g., 041201, Buffalo-Eighteenmile Basin, New York). The next two digits of the HUC are the Cataloging Unit (e.g., 04120103, Buffalo-Eighteenmile). Table 10: *Buffalo-Eighteenmile Watershed* lists the HUC-8 code and the name for the watershed.

Table 10: Buffalo-Eighteenmile Watershed

HUC 8 Code	Name
04120103	Buffalo-Eighteenmile

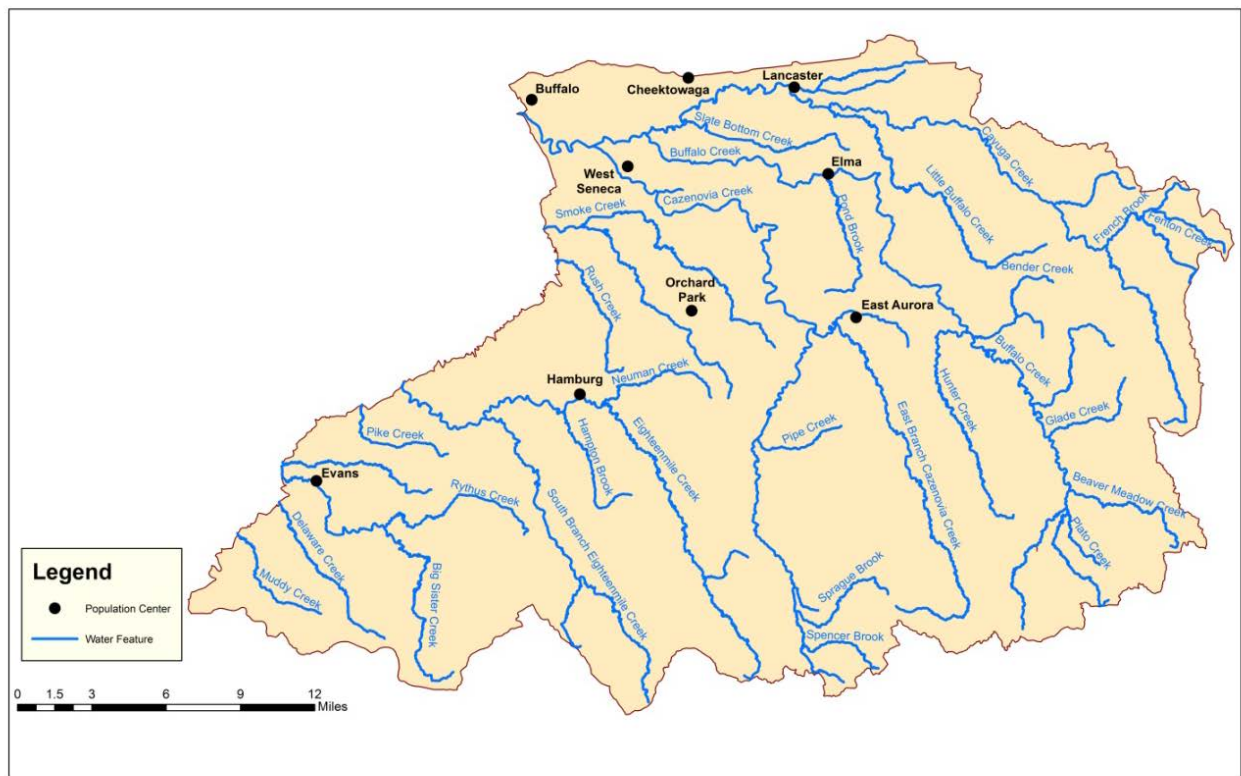


Figure 9: Buffalo-Eighteenmile Watershed

Jurisdictional Boundaries

Jurisdictional boundaries were obtained from NYSDEC and are also available through the [New York State GIS Clearinghouse](#). During the Discovery Meetings, officials reviewed their jurisdictional boundaries as presented on the work maps. No communities noted discrepancies with the jurisdictional boundaries presented.

Transportation

Transportation features include roads, rail, and air. Transportation 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 FIRM databases and supplemented with data from communities and the [New York State GIS Clearinghouse](#).

Flood Risk and Mapping Data

FEMA FIRMs, Letters of Map Change (LOMCs), historical flooding information, and FEMA's Coordinated Needs Management Strategy (CNMS) database can all provide important information about flooding problems and hot spots within communities and where mitigation and risk communication efforts would be most beneficial. This information was reviewed as part of the Lake Erie Buffalo-Eighteenmile Watershed Discovery process and is summarized in the sections below.

Regulatory Mapping

The Buffalo-Eighteenmile Watershed covers portions of three counties; Erie, Genesee, and Wyoming. The mapping in place is a mix of recently revised and older FIRMs.

In Erie County, an effective partial countywide FIRM dated September 26, 2008, covers the towns of Collins, Holland, Wales and the City of Buffalo. This partial countywide FIRM provided updated flood hazard analyses for Cazenovia Creek, Ellicott Creek, and Spicer Creek. The remainder of the Erie County communities have community-based maps with dates that range from 1976-2003.

The villages of Farnham and Sloan in Erie County have no FIRMs, and are participating with no SFHAs identified. Even though the communities do not have a FIRM, residents are still eligible to purchase flood insurance.

As of August 2014, the Village and Town of North Collins in Erie County were not participating in the NFIP. As a result, the economic consequences of Sections 201(d) and 202 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) may apply. The Village and Town of North Collins were invited to participate in this Discovery process.

Genesee County does not have a countywide FIRM. The Town of Darien has an effective FIRM dated July 6, 1984. Similarly, Wyoming County does not have a countywide FIRM. The effective dates for the community-based maps range from 1977-1992.

The effective countywide FIS/FIRM dates for each of the participating communities is shown in Table 11: *FIS/FIRM Effective Dates*. Federal flood insurance is not available in communities that do not participate in the NFIP.

Table 11: FIS/FIRM Effective Dates (as of August 2014)

County	Coastal	Community	FIS/FIRM Effective Date	Notes
Erie	No	Alden, Town of	2/6/1991	Partial countywide effective 9/26/2008. Community-based Effective FIRM dates range from 1976-2008.
		Angola, Village of	8/6/2002	
		Aurora, Town of	4/16/1979	
		Blasdell, Village of	6/25/1976	
		Boston, Town of	9/30/1981	
	Yes	Brant, Town of	1/6/1984	
		Buffalo, City of	9/26/2008	
	No	Cheektowaga, Town of	3/15/1984	
		Colden, Town of	7/2/1979	
		Collins, Town of	9/26/2008	
		Concord, Town of	9/4/1986	
		Depew, Village of	8/3/1981	
		East Aurora, Village of	8/6/2002	
		Eden, Town of	8/24/1979	
		Elma, Town of	6/22/1998	

Table 11: FIS/FIRM Effective Dates (as of August 2014)

County	Coastal	Community	FIS/FIRM Effective Date	Notes
Erie (cont'd)	Yes	Evans, Town of	2/2/2002	Partial countywide effective 9/26/2008. Community-based Effective FIRM dates range from 1976-2008.
	No	Farnham, Village of	None*	
	Yes	Hamburg, Town of	12/20/2001	
	No	Hamburg, Village of	1/20/1982	
		Holland, Town of	9/26/2008	
	Yes	Lackawanna, City of	7/2/1980	
	No	Lancaster, Town of	2/23/2001	
		Lancaster, Village of	7/2/1979	
		Marilla, Town of	9/29/1978	
		North Collins, Town of	None**	
		North Collins, Village of	None**	
		Orchard Park, Town of	3/16/1983	
		Orchard Park, Village of	9/2/1981	
		Sardinia, Town of	1/16/2003	
		Sloan, Village of	None*	
		Wales, Town of	9/26/2008	
		West Seneca, Town of	9/30/1992	
Genesee	No	Darien, Town of	7/6/1984	No countywide study
Wyoming	No	Arcade, Town of	3/3/1992	No countywide study Community-based Effective FIRM dates range from 1983-1992.
		Bennington, Town of	12/23/1983	
		Java, Town of	12/23/1983	
		Sheldon, Town of	12/23/1983	

*Participating without FIRMs

**Non-Participating without FIRMs

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 a property owner 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), for properties on natural high ground and the Letter of Map Revision based on Fill (LOMR-F), for properties elevated by the placement of fill, are the most common ways used by property owners to amend the effective FIRM. These methods do not physically change the FIRM for a community; rather they amend, *by letter*, the FIRM and do not result in the publication of a revised FIRM panel. By comparison, a Letter of Map Revision (LOMR) is commonly used by community officials to request FIRM revisions stemming from completed development, flood-control projects, or other

larger-scale changes. LOMRs physically revise a portion of a FIRM panel or panels and/or the Flood Insurance Study (FIS) report.

Table 12: *LOMCs in the Project Area* and Figure 10 highlight the areas within the Buffalo-Eighteenmile Watershed that have LOMCs. There are 319 LOMAs/LOMR-F and no LOMRs located in the Buffalo-Eighteenmile Watershed. Erie County has 317 LOMCs, 120 of which are within the City of Buffalo. Wyoming County has two LOMA/LOMR-F and Genesee County has no LOMA/LOMR-Fs.

More information on the LOMA and LOMR-F processes can be found on [FEMA's LOMC website](#) or by reviewing Attachment 4 - *LOMA-LOMR-F Fact Sheet*, included with the digital copy of this Discovery Report.

Table 12: LOMCs in Project Area (as of August 2014)

County	Community	Number of LOMA/LOMR-Fs	Number of LOMRs	FIRM Effective Date
Erie	Alden, Town of	5	0	2/6/1991
	Angola, Village of	1	0	8/6/2002
	Aurora, Town of	1	0	4/16/1979
	Blasdell, Village of	0	0	6/25/1976
	Boston, Town of	0	0	9/30/1981
	Brant, Town of	1	0	1/6/1984
	Buffalo, City of	120	0	9/26/2008
	Cheektowaga, Town of	10	0	3/15/1984
	Colden, Town of	0	0	7/2/1979
	Collins, Town of	0	0	9/26/2008
	Concord, Town of	2	0	9/4/1986
	Depew, Village of	2	0	8/3/1981
	East Aurora, Village of	7	0	8/6/2002
	Eden, Town of	1	0	8/24/1979
	Elma, Town of	12	0	6/22/1998
	Evans, Town of	21	0	2/2/2002
	Farnham, Village of	0	0	Participating without FIRMs
	Hamburg, Town of	44	0	12/20/2001
	Hamburg, Village of	4	0	1/20/1982
	Holland, Town of	1	0	9/26/2008
	Lackawanna, City of	23	0	7/2/1980
	Lancaster, Town of	19	0	2/23/2001
	Lancaster, Village of	4	0	7/2/1979
	Marilla, Town of	1	0	9/29/1978

Table 12: LOMCs in Project Area (as of August 2014)

County	Community	Number of LOMA/ LOMR-Fs	Number of LOMRs	FIRM Effective Date
Erie (cont'd)	North Collins, Town of	0	0	Not Participating
	North Collins, Village of	0	0	Not Participating
	Orchard Park, Town of	15	0	3/16/1983
	Orchard Park, Village of	1	0	9/2/1981
	Sardinia, Town of	1	0	1/16/2003
	Sloan, Village of	0	0	Participating without FIRMs
	Wales, Town of	1	0	9/26/2008
	West Seneca, Town of	20	0	9/30/1992
Genesee	Darien, Town of	0	0	7/6/1984
Wyoming	Arcade, Town of	0	0	3/3/1992
	Bennington, Town of	1	0	12/23/1983
	Java, Town of	0	0	12/23/1983
	Sheldon, Town of	1	0	12/23/1983

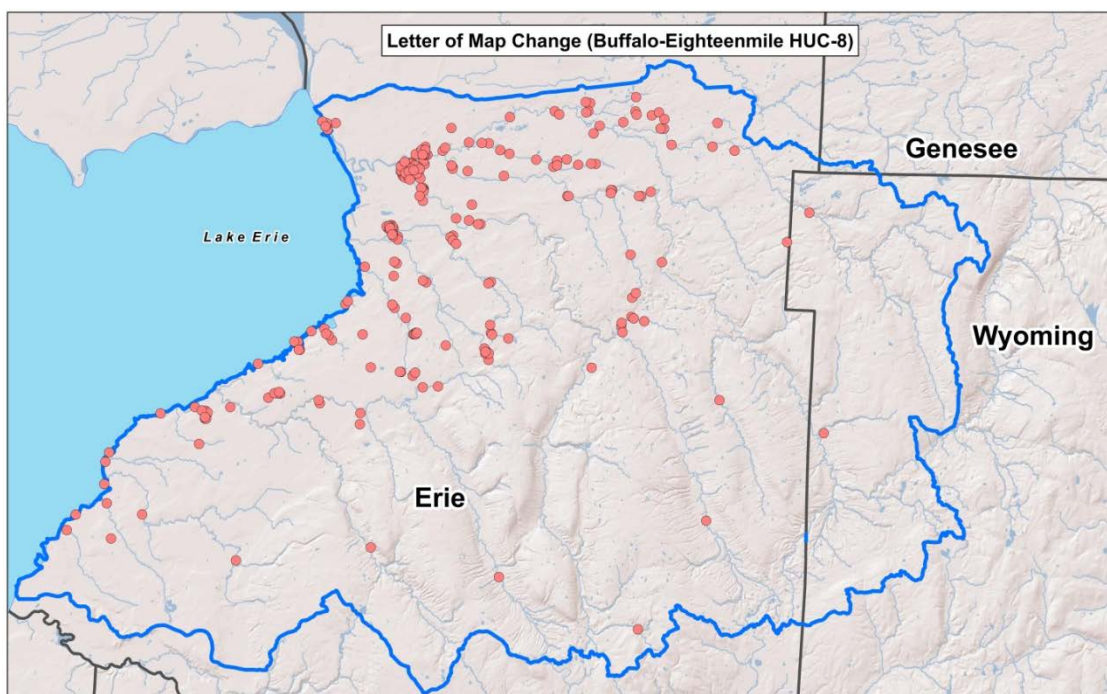


Figure 10: Location of LOMCs in the Buffalo-Eighteenmile Watershed

Historical Flooding

Throughout the recorded history of the Buffalo-Eighteenmile Watershed, flooding has been a constant threat. Flooding most often occurs in the late winter-early spring months when melting snow may combine with intense rainfall to produce increased runoff. Ice jams and debris have often increased flood heights by impeding water flow at bridges and culverts. Floods can result from a collision over the watershed of a large mass of warm moisture-laden air from the north with a cold front; from sharp rises in temperature in the spring that melt the snow cover of the basin and are followed by rains; and from localized thunderstorms. Table 13: *FIS Historical Flooding Areas* summarizes the historical flooding noted in each community's FIS report.

Table 13: FIS Historical Flooding Areas

County	Community	Event Date	Areas of Concern
Erie	Towns of Alden, Cheektowaga and Lancaster	March 1936	Flooding occurs along Ellicott Creek and Cayuga Creek. The greatest flood of record in the area occurred in March 1936 and caused heavy damage by washing out roads and bridges. The discharge was estimated to be 6,500 cfs at the location of the Williamsville gage (before it was constructed in 1955).
	Buffalo, City of	March 1942, March 1955, March 1956, January 1959	Major floods along Cazenovia Creek occurred in March 1942, March 1955, March 1956, and January 1959. These floods were caused by a combination of major rainfall, augmented by snowmelt and runoff and increased by frozen ground. These storms each had a magnitude equal to or greater than the 15-year flood. The most severe storm on record was that of March 1955, which was equivalent to a 4-percent-annual-chance (25-year) flood.
	Towns of Aurora and Colden	Sept. 27, 1967	A heavy rainstorm caused streams to flood and property damages were reported because of the flooding.
	Lancaster, Town of & Depew, Village of	June 1937 & August 1963	The storm of June 1937 caused Cayuga Creek to have a peak discharge of 18,000 cfs downstream of Bowen Road. This discharge is estimated to be approximately a 0.2-percent-annual-chance (500-year) flood event. In August 1963, the intensity of rainfall during this storm period was in excess of the estimated 1-percent-annual chance (100-year) intensity. The discharge on Scajaquada Creek measured 2,620 cfs.

Table 13: FIS Historical Flooding Areas

County	Community	Event Date	Areas of Concern
Erie (cont'd)	Hamburg, Town of	Frequent	The Lake Erie shoreline is a major area of flooding, due to wave action and high winds. This is particularly noticeable at the Hoover Beach area. Waves have been recorded over the tops of houses there and have reached State Route 5. The lake causes another flooding problem along its shores as the water level rises, it causes streams to back up. The stream flow spreads out in low-lying areas, especially Woodlawn and Hoover Beach.
	Lackawanna, City of and West Seneca, Town of	January 1959 and various other unidentified dates	Flooding along Smoke Creek, South Branch Smoke Creek, and the Lake Erie shoreline occurs when heavy rains (which may be associated with thaws) and high winds cause the water levels in Lake Erie and the streams to rise. Ice jams are significant factors in most flooding.
	Lancaster, Village of	Various	Flooding along Cayuga Creek, Plum Bottom Creek, and Spring Creek occurs as a result of discharges in excess of channel capacity, restrictive bridges and culverts and ice jams. Prior to completion of the levees in 1951, repeated damage due to flooding from the overflow of Cayuga Creek occurred within the village.
Genesee County	Darien, Town of	N/A	N/A
Wyoming County	Arcade, Town of	July 6, 1902	The estimated peak discharge was 27,000 cfs at a former USGS gage site. That flood is estimated to have had a recurrence interval of greater than 200 years.

N/A –Information unavailable

Historical flooding events were also included in several of the community Hazard Mitigation Plans (HMPs). Significant events from these plans are summarized in Table 14: *Hazard Mitigation Plan Significant Flood Events*.

Many spring and fall rainfall events have resulted in significant damage to property and infrastructure within the Buffalo-Eighteenmile Watershed. Flooding is not a high hazard in Erie County because few structures are located within the floodplain and most of the stream banks in flood-prone areas are quite high. When flooding does occur, it is typically due to excessive rainfall, snowmelt, and ice jams. Between 1993 and 2002, a total of 33 floods or flash floods occurred in Erie County and caused damage that amounted to \$4.8 million. At the time of this report, Erie County's HMP included historical flood events for the whole jurisdiction and not for individual municipalities.

In Genesee County, the two most dangerous and destructive sources of flooding are Oatka Creek and Tonawanda Creek. The Genesee County HMP notes that the Town of Darien is a flood hazard "pocket" within Genesee County.

Wyoming County's HMP notes that seven flood incidents have been recorded since the previous effective HMP, totaling \$258,000 in damages. A total of 44 flood incidents have occurred between 1900 and 2012; the resulting damage is estimated at approximately \$14 million. These incidents, which are considered by the County as separate from minor seasonal floods, tend to cause power outages, potable water shortages, school and business closings, and property damage.

Historical flooding events were also included in several of the community Hazard Mitigation Plans (HMPs). Significant events from these plans are summarized in Table 14: *Hazard Mitigation Plan Significant Flood*.

Table 14: Hazard Mitigation Plan Significant Flood Events

County	Community	Flood Events of Significance
Erie	Alden, Town of	<p>Historical flooding in Erie County is not identified by community in the HMP. Such granularity should be, and may be, provided in local HMPs.</p> <p>Between 1993 and 2002, a total of 33 floods or flash floods occurred in Erie County resulting in 4.8 million dollars in damages.</p>
	Angola, Village of	
	Aurora, Town of	
	Blasdell, Village of	
	Boston, Town of	
	Brant, Town of	
	Buffalo, City of	
	Cheektowaga Town of	
	Colden, Town of	
	Collins, Town of	
	Concord, Town of	
	Depew, Village of	
	East Aurora, Village of	
	Eden, Town of	
	Elma, Town of	
	Evans, Town of	
	Farnham, Village of	
	Hamburg, Town of	
	Hamburg, Village of	
	Holland, Town of	
	Lackawanna, City of	
	Lancaster, Town of	
	Lancaster, Village of	
	Marilla, Town of	
	North Collins, Town of	
	North Collins, Village of	
	Orchard Park, Town of	
	Orchard Park, Village of	
	Sardinia, Town of	
	Sloan, Village of	
	Wales, Town of	
	West Seneca, Town of	

Table 14: Hazard Mitigation Plan Significant Flood Events

County	Community	Flood Events of Significance
Genesee	Darien, Town of	<p>June 1989: A major rainstorm caused severe flash flooding that inundated portions of the highway system and damaged/destroyed roads and bridges (\$6,000 in damage).</p> <p>July 1998: Heavy rainfall caused road closures and washouts.</p> <p>April 2004: Thunderstorms and hail caused structural damage to the area.</p> <p>May 2004: Thunderstorms brought heavy rains, which caused road closures and basement flooding.</p>
Wyoming	Arcade, Town of	<p>June and July 1998: Severe thunderstorms caused heavy rain on already saturated ground.</p> <p>August and September 2000: Numerous thunderstorms caused heavy rainfall.</p>
	Bennington, Town of	N/A
	Java, Town of	<p>September 2000: Heavy rainfall caused localized flooding.</p> <p>May 2011: Localized rainfall and thunderstorms caused flash flooding, which led to road closures, basement flooding, and State of Emergency declarations (\$75,000 in property damage).</p>
	Sheldon, Town of	<p>September 2000: Heavy rainfall caused localized flooding.</p> <p>June 2005: Tonawanda Creek rose two feet and caused flooding as the result of heavy rainfall in a short period of time.</p> <p>August 2009: Thunderstorms brought heavy rains and hail, which caused flash flooding and damaged road shoulders.</p>

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, severe winter storms, and other non-cyclonic events with the most recent declared event occurring in the watershed November 17-27, 2014.

The President is authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act to declare a disaster for any emergency situation or natural event when states and local

municipalities need federal assistance. Once the President declares that a major disaster or emergency exists, an array of Federal programs to assist in the response and recovery effort are activated. The determination of which programs are activated following a particular event is based on the needs found during damage assessments and any subsequent information that may be discovered.

The major flood-related disaster declarations for the study area are listed in Table 15: *Disaster Declarations*. Since 1972 there have been 12 federally declared disasters where flooding was a factor within the study area. FEMA's disaster declarations and emergency declarations history can be viewed at FEMA's website at <http://www.fema.gov/disasters>.

Table 15: Disaster Declarations (as of January 2015)

Date	Title of Event	Number of Counties Declared within Study Area
6/1/1972	New York Tropical Storm Agnes	1
3/1/1973	New York High Winds, Wave Action, Flooding	1
3/1/1976	New York Ice Storm, Severe Storms, Flooding	3
3/1/1985	New York Snow Melt, Ice Jams	1
1/1/1996	New York Severe Storms/Flooding	2
June & July 1998	New York Severe Storms and Flooding	3
May to August 2000	New York Severe Storms	1
July & August 2003	New York Severe Storms, Tornadoes, and Flooding	1
May & June 2004	New York Severe Storms and Flooding	3
10/1/2006	New York Severe Storms and Flooding	2
8/1/2009	New York Severe Storms and Flooding	1
11/17/2014	New York Severe Winter Storm, Snowstorm, and Flooding	3

High Water Marks

A limited number of verified High Water Mark (HWM) data was available from the USGS or USACE prior to the Discovery meeting. During the pre-Discovery and Discovery meetings, communities identified the following verifiable HWMs:

- Towns of Colden and West Seneca - Buffalo and Cazenovia Creeks
- Town of Holland - East Branch Cazenovia Creek
- City of Lackawanna noted HWMs.
- Town of Arcade noted the availability of HWMs though specific information related to the stream extent and location was not provided.

NYSDEC meetings in 2005 indicate that HWMs may be available in the Town of Alden along Cayuga Creek at the Four Rod Road bridge and along Ellicott Creek at the Sandridge Road bridge.

Ice Jams

As explained by the NWS Office, “ice jams cause localized flooding which can in turn quickly cause serious problems in the area. 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. The NWS (found [online](#) or in References section of this report) notes the conditions of both below:

Freeze Up Jam Criteria:

“Three consecutive days with daily average temperatures of less than 0°F. Early to midwinter 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.

Flooding caused by ice jams is not calculated nor shown on FEMA’s FIRMs. Furthermore, the 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.

Table 16: *Ice Jam Flooding Sources* identifies some of the known “trouble spots” of ice jamming in the watershed. The complete list with fuller descriptions of the circumstances of jamming at each location can be found on the <http://icejams.crrel.usace.army.mil/>

Table 16: Ice Jam Flooding Sources

Flooding Source	Location
Big Sister Creek	Evans
Buffalo Creek	Elma, West Seneca
Buffalo River	Buffalo
Cayuga Creek	Alden, Cheektowaga, Lancaster
Cazenovia Creek	Buffalo, West Seneca
Clear Creek	Collins
Elliott Creek	Lancaster
Muddy Creek	Evans
Niagara River	Buffalo

Table 16: Ice Jam Flooding Sources

Flooding Source	Location
Smoke Creek	Lackawanna
Tannery Brook	East Aurora

The following measures will help communities prepare for and address ice jam conditions as they occur.

Ice Jam Preparedness

1. Monitoring areas to identify problem areas early
2. Alert system for evacuation
3. Identification of evacuation routes if ice jam overtops roads
4. Mitigation
 - a. Ice weakening/thinning/removal
 - b. Equipment placement
 - c. Supplies
 - Sandbags
 - Jersey barriers
5. Permanent Measures
 - a. Freeze up Jam Control
 - Displace jam location
 - Control production and transport of frazil ice
 - b. Break up Jam Control
 - Control timing of breakup
 - Displace jam location

During the Discovery meetings and on the community data worksheets, several communities noted areas of historic and repeated ice jams. Ice jam locations were noted within Erie County, in the towns of Colden, Evans (Muddy Creek and Big Sister Creek), West Seneca (Buffalo and Cazenovia Creeks), Concord (Cattaraugus Creek), Holland, Aurora, Orchard Park. The City of Buffalo and Village of East Aurora also noted historic and repeated ice jam conditions along Tanney Brook. Specific information related to the stream extent and location was not provided.

Coordinated Needs Management Strategy (CNMS) and NFIP Mapping Needs

The Lake Erie Discovery process did identify unmet needs. During many discussions with community officials, the need or desire for updated digital FIRMs was raised. Many of the communities do not have digital maps and the information depicted on the maps is not current (e.g., location of flooding and roads). As presented in Table 25: *Summary of the State of Community Floodplain Mapping* and Table 26: *Summary of Community Floodplain Mapping Needs*, municipalities within Erie, Wyoming, and Genesee Counties have noted their current flood maps are not accurate.

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 seven 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":

1. Change in the gage record: Has a major flood event caused a sizable change in gage record since effective analysis?
2. 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)*?
3. Model methodology: Is the model methodology no longer appropriate based on FEMA's G&S?
4. Hydraulic change: Has a major flood-control structure (dam/levee/floodwall/other change) been added or removed from the reach?
5. Channel reconfiguration: Is the current channel reconfiguration outside the effective SFHA? (i.e., has the stream moved?)
6. Other hydraulic changes: Have more than five hydraulic structures (bridge/culvert) been added or removed that impact Base Flood Elevations (BFEs) on the reach?
7. 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 "Unverified". 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 "Unverified."

1. Regression Equation: Has a rural regression equation been used in a now urbanized area?
2. Repetitive Loss: Are there repetitive losses outside the SFHA?
3. Impervious Area: Has there been an increase in impervious area in the sub-basin of equal to or greater than 50 percent of previous area (i.e., 10 percent to 15 percent, 20 percent to 30 percent, etc.)?
4. Hydraulic Structure: Have more than one, but less than five, hydraulic structures (bridge/culvert) been added or removed that impact BFEs on the reach?
5. Channel Improvements: Have there been channel improvements or shoreline changes?
6. Topography Data: Is better topography and/or bathymetry available?
7. Vegetation or Land Use: What changes to vegetation or land use have occurred in the area?

8. Coastal Dune: Failure to identify primary frontal dune in coastal areas?
9. High Water Mark: Have significant storms occurred with recorded HWMs?
10. Regression Equation: Are new regression equations available?

CNMS is a living database that is continuously updated whenever new or revised studies become available. Valid stream reaches will be reassessed every five years and Unverified streams will be prioritized for potential funding. Watershed Discovery meetings will provide input for CNMS community requests and help prioritize studies in the watershed. Table 17: *Current Status of CNMS* shows the status of the counties in this project area prior to the Discovery process.

A CNMS Factsheet is included in the digital version of this Discovery Report as Attachment 6 - *Coordinated Needs Management Strategy*. More information about CNMS can also be found on [FEMA's CNMS webpage](#) or by viewing an informative CNMS PowerPoint® presentation of the process created by the [Illinois State Water Survey](#).

Table 17: Current Status of CNMS

County	Stream Mileage within Buffalo-Eighteenmile Watershed			
	Valid	Unverified	Unknown	Total
Erie	195.11	47.08	132.09	374.27
Genesee	-	-	1.53	1.53
Wyoming	-	-	59.27	59.27

All needs identified as a result of this Discovery process have been included in both CNMS and this Discovery Report.

Other Data and Information

The following section contains a summary of other information that helped the study team to better understand the study area, local flood risks, and potential mitigation needs within the watershed as part of this Discovery project.

Flood Insurance Policies

A community's agreement to adopt and enforce floodplain management ordinances as part of the NFIP, particularly with respect to new development, is an important element in making federally-backed flood insurance available to home and business owners. For this Discovery project, data on NFIP flood insurance policies in the watershed communities were gathered.

As of May 2014, 1,576 policies were in-force in the Buffalo-Eighteenmile Watershed, accounting for \$232 million in insurance coverage and \$1.5 million in written premiums. The number of policies, total coverage, and total premium cost are listed in Table 18: *Flood Insurance Policy Data*.

Erie County represents 98.8 percent of the insurance policies (1,567) and insurance coverage (\$229.216 million) within the Buffalo-Eighteenmile Watershed. In Erie County, the City of Lackawanna has 448 policies and over \$35 million in coverage, and the Town of Evans has 171

policies and \$19.8 million in coverage. Since 1978, 417 claims exceeding \$1 million occurred in the City of Buffalo followed by the Town of Cheektowaga with 201 claims for \$1.19 million. The Town of Hamburg has had the most monetary amount paid on claims since 1978, with \$1.3 million for 154 claims.

Table 18: Flood Insurance Policy Data (as of May 2014)

County	Community	Number of Policies by Zone			Total Coverage	NFIP Total Premium	Total Claims Since 1978	Total Paid Since 1978
		V-Zone*	A-Zone	Total Policies				
Erie	Alden, Town of	0	8	15	\$2,491,700	\$13,828	17	\$74,139
	Angola, Village of	0	1	2	\$214,900	\$1,704	19	\$91,619
	Aurora, Town of	0	3	11	\$2,412,100	\$9,559	13	\$98,974
	Blasdell, Village of	0	0	0	\$0	\$0	25	\$150,556
	Boston, Town of	0	2	11	\$3,554,100	\$8,314	17	\$87,636
	Brant, Town of	0	1	1	\$33,300	\$437	10	\$307,628
	Buffalo, City of	0	97	148	\$18,430,800	\$109,284	417	\$1,064,579
	Cheektowaga Town of	0	110	145	\$36,427,700	\$189,040	201	\$1,196,690
	Colden, Town of	0	2	8	\$1,487,400	\$3,350	5	\$3,565
	Collins, Town of	0	3	4	\$658,900	\$3,542	5	\$74,715
	Concord, Town of	0	2	6	\$785,000	\$2,978	8	\$58,398
	Depew, Village of	0	9	23	\$4,959,200	\$17,817	33	\$23,675
	East Aurora, Village of	0	27	33	\$6,373,600	\$44,897	37	\$137,272
	Eden, Town of	0	4	7	\$1,408,200	\$7,394	6	\$35,311
	Elma, Town of	0	9	24	\$6,025,400	\$25,404	24	\$40,892
	Evans, Town of	0	145	171	\$19,826,600	\$155,562	88	\$413,107
	Farnham, Village of	0	0	2	\$195,400	\$2,429	1	\$2,445
	Hamburg, Town of	0	82	144	\$25,356,600	\$126,884	154	\$1,303,251
	Hamburg, Village of	0	4	12	\$2,496,100	\$21,423	24	\$178,995
	Holland, Town of	0	3	4	\$600,100	\$4,303	2	\$2,738
	Lackawanna, City of	0	423	448	\$35,069,200	\$332,558	93	\$110,736
	Lancaster, Town of	0	61	94	\$18,512,000	\$114,372	45	\$305,203
	Lancaster, Village of	0	11	15	\$1,824,100	\$13,821	5	\$4,698
	Marilla, Town of	0	2	7	\$1,511,500	\$4,209	1	\$15,190
	**North Collins, Town of	-	-	-	-	-	-	-
	**North Collins, Village of	-	-	-	-	-	-	-

Table 18: Flood Insurance Policy Data (as of May 2014)

County	Community	Number of Policies by Zone			Total Coverage	NFIP Total Premium	Total Claims Since 1978	Total Paid Since 1978
		V-Zone*	A-Zone	Total Policies				
Erie (Cont'd)	Orchard Park, Town of	0	11	29	\$5,013,500	\$22,332	11	\$8,609
	Orchard Park, Village of	0	12	17	\$3,368,800	\$25,968	7	\$59,651
	Sardinia, Town of	0	5	5	\$815,600	\$9,131	6	\$108,049
	Sloan, Village of	0	0	0	\$0	\$0	1	\$0
	Wales, Town of	0	1	2	\$90,000	\$851	4	\$2,133
	West Seneca, Town of	0	136	169	\$29,562,600	\$214,858	175	\$672,016
Genesee	Darien, Town of	0	3	3	\$296,900	\$2,683	0	\$0
Wyoming	Arcade, Town of	0	3	6	\$714,400	\$3,893	5	\$7,377
	Bennington, Town of	0	1	3	\$513,600	\$1,936	0	\$0
	Java, Town of	0	2	3	\$399,000	\$2,051	1	\$8,228
	Sheldon, Town of	0	1	4	\$719,000	\$3,455	2	\$16,362
Total:		0	1,184	1,576	\$232,147,300	\$1,500,267	1,451	\$6,664,437

*V Zones are not identified on the current effective flood mapping for the Buffalo-Eighteenmile Watershed

** This community does not participate in the NFIP.

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 Buffalo-Eighteenmile Watershed, there were 223 RLs within the study area as of May 2015, accounting for \$2.9 million in claims paid. The Town of Hamburg, City of Buffalo and the Town of Evans have the most RL properties within the watershed. The Village of Arcade in Wyoming County has 10 RL losses that have averaged \$30,777 per claim, the highest claim amount for the study area. The data are shown in Table 19: *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) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart. Within the Buffalo-Eighteenmile Watershed, 11 of the RL properties also meet the criteria for SRL properties. All of the SRL are within Erie County and include the Town of Aurora (1 property), City of Buffalo (3 properties), Town of Evans (3 properties), Village of Farnham (1 property), Town of Hamburg (2 properties), and the Town of Lancaster (1 property). Of the 223 losses, 49 are related to the SRL properties and account for \$800,641 in claims paid.

Of the communities that have RLs and SRLs, only four communities (towns of Evans, West Seneca, Aurora and Lancaster) noted that they were aware of the RLs in their communities during the Discovery Meetings.

Table 19: Repetitive Losses in Study Area (as of May 2015)

County	Community	Number of RLs	Total Claims Paid	Average Claim Paid
Erie	Alden, Town of	2	\$51,365	\$25,683
	Angola, Village of	2	\$27,946	\$13,973
	Aurora, Town of	7	\$85,677	\$9,606
	Blasdell, Village of	4	\$49,018	\$12,255
	Boston, Town of	7	\$35,443	\$4,968
	Brant, Town of	0	-	-
	Buffalo, City of	40	\$387,448	\$8,812
	Cheektowaga Town of	18	\$471,729	\$22,251
	Colden, Town of	0	-	-
	Collins, Town of	0	-	-
	Concord, Town of	4	\$53,058	\$13,264
	Depew, Village of	5	\$21,803	\$4,728
	East Aurora, Village of	2	\$3,205	\$1,603
	Eden, Town of	2	\$9,523	\$4,762
	Elma, Town of	9	\$26,094	\$2,847
	Evans, Town of	22	\$221,160	\$9,289
	Farnham, Village of	2	\$43,500	\$21,750
	Hamburg, Town of	51	\$733,899	\$13,720
	Hamburg, Village of	5	\$90,908	\$21,114
	Holland, Town of	0	-	-
	Lackawanna, City of	4	\$13,692	\$3,423
	Lancaster, Town of	9	\$107,370	\$9,347
	Lancaster, Village of	0	-	-
	Marilla, Town of	0	-	-
	North Collins, Town of	-	-	-
	North Collins, Village of	-	-	-
	Orchard Park, Town of	0	-	-
	Orchard Park, Village of	2	\$27,603	\$13,802
	Sardinia, Town of	0	-	-
	Sloan, Village of	2	\$6,673	\$3,337
	Wales, Town of	0	-	-
	West Seneca, Town of	14	\$129,543	\$9,253
Genesee	Darien, Town of	0	-	-
Wyoming	Arcade, Town of	10	\$307,769	\$30,777
	Bennington, Town of	0	-	-
	Java, Town of	0	-	-
	Sheldon, Town of	0	-	-
TOTAL		223	\$2,904,426	\$11,844

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 as of 2005 and that number continues to grow. RL properties not only increase the NFIP's annual losses and the need for borrowing funds from Congress, they also drain funds needed to prepare for future catastrophic events.

Clusters of RL and previous NFIP assistance, including claims and other financial support such as Flood Mitigation Assistance and Hazard Mitigation Assistance grants, are used to identify "hot spot" areas within communities. This information can be used to identify areas of mitigation interest and updated mapping needs and products for individual communities.

Community Rating System (CRS)

The CRS is a voluntary incentive program that provides flood insurance premium discounts to NFIP-participating communities that take extra measures to manage floodplains above the minimum requirements. 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 of May 2014, the City of Lackawanna in Erie County was a Class 8 participating CRS community. A Class 8 rating results in flood insurance premiums discounted 10% for properties inside SFHAs and 5% for properties outside SFHAs on the FIRM within the city. The city entered into the CRS program in October 1992. No other communities within the study area participate in the CRS. For more information on CRS, please see Attachment 5 - *Joining the CRS Program*, or visit [FEMA's CRS website](#).

Community Assistance Visits (CAVs) and Community Assistance Contacts (CACs)

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

CACs

The CAC is a telephone call or brief visit by a FEMA staff member (or staff of a State agency on behalf of FEMA) verifying the community's designated floodplain manager and their contact information.

CACs in the watershed have been sporadic during the last 20 years. CACs are a tool employed by FEMA and its state partners to periodically contact a community to see if they are having any difficulties in administering the local floodplain management ordinance or program. The CAC can be used as a way to screen for potential community floodplain management issues that would require a CAV. CACs are also a means of encouraging Code Enforcement Officers to attend annual floodplain management workshops. CACs can serve as a means to support local officials when they need help effectively administering the NFIP in their community.

CAVs

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

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

CAVs are also a way to provide technical assistance to communities. 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 §60.3, §60.4, or §60.6. "Open" CAVs can be indicative of unresolved violations.

CAVs performed within the project area are identified in Table 20: *CAVs and CACs Performed within the Project Area*. Due to the sensitive nature of the information collected, CAV findings are not captured in this report. However, most communities within the Buffalo-Eighteenmile Watershed did not have any problems or violations noted during the visit. Six communities within the watershed had serious engineering problems listed during the CAV, and of those, one of the communities had program problems, violations, and remedial actions required. All six communities were listed as requiring remedial actions before closing the CAV.

Table 20: CAVs and CACs Performed within the Project Area (as of August 2014)

County	Community Name	CAV Date	CAC Date
Erie	Alden, Town of	11/15/2012	05/11/2010
	Angola, Village of	04/01/1983	06/20/2007
	Aurora, Town of	03/18/2008	05/04/2005
	Blasdell, Village of	01/22/1992	02/24/2011
	Boston, Town of	06/21/2007	-
	Brant, Town of	11/15/1995	-
	Buffalo, City of	10/13/1999	04/08/2005
	Cheektowaga, Town of	02/26/1996	-
	Colden, Town of	03/22/1994	05/01/2008
	Collins, Town of	-	06/26/1997

Table 20: CAVs and CACs Performed within the Project Area (as of August 2014)

County	Community Name	CAV Date	CAC Date
Erie (Cont'd)	Concord, Town of	-	01/14/2011
	Depew, Village of	02/22/2008	07/22/1997
	East Aurora, Village of	03/18/2008	12/10/1998
	Eden, Town of	-	-
	Elma, Town of	03/29/2012	04/08/2005
	Evans, Town of	06/14/2007	08/02/2005
	Farnham, Village of		06/20/2007
	Hamburg, Town of	11/30/2004	04/13/2005
	Hamburg, Village of	12/14/2004	-
	Holland, Town of	06/09/1998	-
	Lackawanna, City of	04/01/2009	06/26/1998
	Lancaster, Town of	02/03/2009	-
	Lancaster, Village of	03/26/2010	-
	Marilla, Town of	04/09/2010	-
	North Collins, Town of	-	-
	North Collins, Village of	-	-
	Orchard Park, Town of	10/11/2002	01/26/2001
	Orchard Park, Village of	07/22/1999	-
	Sardinia, Town of	11/14/2002	03/25/1994
	Sloan, Village of		-
	Wales, Town of	07/17/1997	-
	West Seneca, Town of	06/09/2009	-
Genesee	Darien, Town of	-	-
Wyoming	Arcade, Town of	11/21/2001	-
	Bennington, Town of	12/05/2006	-
	Java, Town of	-	02/08/2007
	Sheldon, Town of	06/03/1997	06/09/1999

Ordinances

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

The following summarizes the three different ordinance levels based on 44 CFR §60.3 that apply to New York State local law for communities participating in the NFIP.

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

Table 21: *Program Status and Ordinance Level* lists the NFIP program status and ordinance level for each community.

Table 21: Program Status and Ordinance Level (as of August 2014)

County	Community	Program Status	Ordinance Level
Erie	Alden, Town of	Regular	D
	Angola, Village of	Regular	D
	Aurora, Town of	Regular	D
	Blasdell, Village of	Regular	D
	Boston, Town of	Regular	D
	Brant, Town of	Regular	D
	Buffalo, City of	Regular	D
	Cheektowaga, Town of	Regular	D
	Colden, Town of	Regular	D
	Collins, Town of	Regular	D
	Concord, Town of	Regular	D
	Depew, Village of	Regular	D
	East Aurora, Village of	Regular	D
	Eden, Town of	Regular	D
	Elma, Town of	Regular	D
	Evans, Town of	Regular	D
	Farnham, Village of	Regular	A
	Hamburg, Town of	Regular	D
	Hamburg, Village of	Regular	D
	Holland, Town of	Regular	D
	Lackawanna, City of	Regular	D
	Lancaster, Town of	Regular	D
	Lancaster, Village of	Regular	D
	Marilla, Town of	Regular	D
	North Collins, Town of	Not Participating	-
	North Collins, Village of	Not Participating	-
	Orchard Park, Town of	Regular	D

Table 21: Program Status and Ordinance Level (as of August 2014)

County	Community	Program Status	Ordinance Level
Erie (Cont'd)	Orchard Park, Village of	Regular	D
	Sardinia, Town of	Regular	D
	Sloan, Village of	Regular	A
	Wales, Town of	Regular	D
	West Seneca, Town of	Regular	D
Genesee	Darien, Town of	Regular	D
Wyoming	Arcade, Town of	Regular	D
	Bennington, Town of	Regular	D
	Java, Town of	Regular	D
	Sheldon, 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 F: *Community Ordinances*.

Hazard Mitigation Plans (HMPs)

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

- Identify vulnerabilities to natural hazards and provide for potential projects to reduce those vulnerabilities in the future;
- Ensure safety and protect life and property by reducing the potential for future damages and economic losses that result from natural hazards;
- Help communities 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 municipal HMPs outline mitigation actions to address vulnerabilities, which officials believe are attainable and can be implemented. Some of these activities include:

- Reduce the number of critical facilities in hazard prone areas;
- Reduce the future development of facilities in flood inundation zones;
- Map out all critical facilities in SFHAs;
- Develop regulations that require zero-increase in runoff;
- Elevate structures located in flood prone areas;
- Require flood resistant building construction methods; and,
- Develop a comprehensive plan to relocate critical facilities to safer areas.

Status of Approved Mitigation Plans

Each municipal HMP was reviewed for initiatives, critical facilities, and mitigation actions. As of September 2014, Erie County communities had an expired HMP with the update under revision; the Town of Darien in Genesee County is Approvable Pending Adoption (APA); the four communities within Wyoming County have approved HMPs. New York State Division of Homeland Security & Emergency Services Office of Emergency Management reviews the local hazard mitigation plans prior to FEMA review and approval.

The status of approved HMPs is shown in Table 22: *Approved Hazard Mitigation Plans*.

Table 22: Approved Hazard Mitigation Plans (as of June 2014)

County	Jurisdiction Name	Approval Date	Plan Expiration
Erie	Alden, Town of	Awaiting Revisions	Awaiting Revisions
	Angola, Village of		
	Aurora, Town of		
	Blasdell, Village of		
	Boston, Town of		
	Brant, Town of		
	Buffalo, City of		
	Cheektowaga Town of		
	Colden, Town of		
	Collins, Town of		
	Concord, Town of		
	Depew, Village of		
	East Aurora, Village of		
	Eden, Town of		
	Elma, Town of		
	Evans, Town of		
	Farnham, Village of	Not in Plan Process/No Plan	Not in Plan Process/No Plan
	Hamburg, Town of	Awaiting Revisions	Awaiting Revisions
	Hamburg, Village of		
	Holland, Town of		
	Lackawanna, City of		
	Lancaster, Town of		
	Lancaster, Village of		
	Marilla, Town of		
	North Collins, Town of		
	North Collins, Village of		
	Orchard Park, Town of		
	Orchard Park, Village of		
	Sardinia, Town of		

Table 22: Approved Hazard Mitigation Plans (as of June 2014)

County	Jurisdiction Name	Approval Date	Plan Expiration
Erie (Cont'd)	Sloan, Village of		
	Wales, Town of	Not in Plan Process/No Plan	Not in Plan Process/No Plan
	West Seneca, Town of	Awaiting Revisions	Awaiting Revisions
Genesee	Darien, Town of	8/23/2011 (APA)	8/23/2016
Wyoming	Arcade, Town of	5/19/2014	5/19/2019
	Bennington, Town of		
	Java, Town of	5/19/2014 (APA)	5/19/2019
	Sheldon, Town of	5/19/2014	5/19/2014

Critical Facilities and Infrastructure

Critical facilities are those entities that are 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. 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.

The HMPs for the Buffalo-Eighteenmile Watershed communities identified critical facilities located within the SFHA within the towns of Arcade and Java. Table 23: *Critical Facilities and Infrastructure* summarizes the critical facilities that were noted in the HMPs as being at risk from flood-related events. Updates to these plans will need to include the critical structure vulnerability.

Table 23: Critical Facilities and Infrastructure

County	Community Name	Facilities Located within SFHA	Facilities noted as at risk for flooding
Erie	Alden, Town of	Awaiting Revisions	Awaiting Revisions
	Angola, Village of		
	Aurora, Town of		
	Blasdell, Village of		
	Boston, Town of		
	Brant, Town of		
	Buffalo, City of		
	Cheektowaga Town of		
	Colden, Town of		
	Collins, Town of		
	Concord, Town of		
	Depew, Village of		

Table 23: Critical Facilities and Infrastructure

County	Community Name	Facilities Located within SFHA	Facilities noted as at risk for flooding
Erie (Cont'd)	East Aurora, Village of	Awaiting Revisions	Awaiting Revisions
	Eden, Town of		
	Elma, Town of		
	Evans, Town of		
	Farnham, Village of		
	Hamburg, Town of		
	Hamburg, Village of		
	Holland, Town of		
	Lackawanna, City of		
	Lancaster, Town of		
	Lancaster, Village of		
	Marilla, Town of		
	North Collins, Town of		
	North Collins, Village of		
	Orchard Park, Town of		
	Orchard Park, Village of		
	Sardinia, Town of		
	Sloan, Village of		
	Wales, Town of		
	West Seneca, Town of		
Genesee	Darien, Town of	None Listed	-
Wyoming	Arcade, Town of	None listed	20 Critical Facilities, 4 of which are Essential Facilities
	Bennington, Town of	None Listed	-
	Java, Town of	None listed	7 Critical Facilities, 4 of which are Essential Facilities
	Sheldon, Town of	None Listed	-

Mitigation Projects

FEMA administers three programs that provide funding for eligible mitigation projects that reduce disaster loss and protect life and property from future disaster damage. The three

programs are the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance (FMA) Program, and the Pre-Disaster Mitigation (PDM) Program.

- [HMGP](#) assists in implementing long-term hazard mitigation measures following a Presidential major disaster declaration;
- [PDM](#) provides funds for hazard mitigation planning and projects on an annual basis; and
- [FMA](#) provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the NFIP on an annual basis.

HMGP funding is generally 15 percent of the total amount of Federal assistance provided to a State, Territory, or federally-recognized tribe following a major disaster declaration. PDM and FMA funding depends on the amount Congress appropriates each year for those programs.

Appendix G lists FEMA funded hazard mitigation projects that have occurred in the project area.

The community HMPs identified mitigation projects/actions/strategies to reduce long-term vulnerability to hazards. Each county listed several mitigation projects related to reducing flood vulnerability.

The Erie County HMP includes mitigation projects that relate to bank stabilization, stream maintenance, and sedimentation removal; public education campaigns about stormwater and flood management; and a property acquisition program for structures in the floodplain. Mitigation actions specific to individual communities are identified as follows:

- Town of Collins: continue to support the ongoing Flood Risk Management Feasibility Study; and
- Town of Hamburg and Village of Blasdell: identify and stop illegal hook-ups of sanitary sewers to storm sewers.

The Wyoming County HMP proposes many county-wide mitigation actions that include the identification of sites for temporary housing and relocation of houses following flood disasters; public education/outreach initiatives related to flooding; establishment of a flood warning system along the Tonawanda Creek; stabilization of stream banks and channels; participation in CRS; development of erosion control and drainage programs; and acquisition of RL properties/relocation of RL property owners. The Town of Java proposes the development of a flood/drainage mitigation program.

During the Discovery meetings and on the community data worksheets completed by community officials in support of this Discovery project, several communities provided examples of completed mitigation activities that have resulted in reduced flood losses. This includes:

- Town of Arcade (Wyoming County) has completed relocation, demolition, and acquisition projects along Clear Creek and Cattaraugus Creek;
- Town of Evans (Erie County) has completed elevation, demolition, and floodproofing following the building permit process;
- City of Buffalo (Erie County) has completed limited park storage, North shoreline stabilization project, and dredging the Buffalo River to reduce flood impacts; and,
- Village of Angola (Erie County) has completed the Herman Park Stream Bank stabilization project.

IV. Discovery Meetings

A series of conference calls with virtual meeting capabilities was held on May 19-20, 2014, and was followed up with three in-person Discovery meetings held June 10-12, 2014, throughout the Lake Erie Watershed.

Webinars

RAMPP conducted the pre-Discovery WebEx™ sessions with public officials on May 19-20, 2014. These sessions introduced the planning team, requested feedback from the municipalities, counties, and regional groups within the project area, determined what additional local floodplain and hazard risk data were available, and who to include in the process.

Invitees to the WebEx™ sessions included community officials engaged in the administration, planning, emergency management, and public works duties of local jurisdictions. A list of the community leaders invited to the sessions is available in Appendix H: *Pre-Discovery Mailing List*. A sample invitation letter is also shown. A record of the participants of these meetings can be found in Appendix I: *Pre-Discovery Stakeholder Meetings*. While not expressly excluded, the public does not generally attend these meetings.

The second half of the session 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, etc. To further expand on this discussion, participants were asked to complete and return community data worksheets to supplement the interactive discussion. Representatives from Genesee, Erie, and Wyoming counties; USACE, USGS, the Seneca Nation of Indians, the Nature Conservancy, and Regional Planning Commissions attended.

The meeting notes are shown in Appendix J: *Kickoff Meeting Notes*. These notes contain comments from those interviewed by RAMPP and other staff to determine each attending community's flood mapping priorities.

In-Person Meetings

The objective of the Discovery meeting(s) was to review new or previously submitted information provided by communities, State and regional agencies, and local stakeholders relevant to the Discovery process; 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 new FIRMs where needed. The in-person Discovery meetings were held 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 the Buffalo-Eighteenmile Watershed. Table 24: *Community Meeting Information* includes meeting dates and locations for the in-person Discovery meetings held that affect the Buffalo-Eighteenmile Watershed.

Table 24: Community Meeting Information

Date and Time	Counties	Meeting Location
Tuesday, June 10, 2014 9:30 AM to 12:00 PM	Erie and Genesee	Woodlawn Beach State Park S-3580 Lakeshore Rd Blasdell, NY 14219
Wednesday, June 11, 2014 9:30 AM to 12:00 PM	Wyoming	Town of Concord Court 86 Franklin Street Springville, NY 14141

Representatives of FEMA, various State agencies, county officials, and several non-governmental organizations attended these sessions in addition to local community officials. Erie County communities represented at the in-person meetings included:

- Town of Aurora
- City of Buffalo
- Town of Colden
- Town of Concord
- Town of Evans
- Village of Hamburg
- Town of Lancaster
- Town of Orchard Park
- Town of Sardinia

Representatives from communities in Genesee and Wyoming Counties did not attend the in-person Discovery meetings.

At the start of the meetings a PowerPoint® presentation was delivered. 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?

Appendices I through L include the Discovery meeting preparation and meeting materials:

- Meeting Agenda/Minutes (Appendix K: *Discovery Meeting Agenda*);
- Meeting Sign-In sheet (Appendix L: *Discovery Meeting Sign-In Sheet*);
- Meeting Presentations (Appendix M: *Discovery Presentation*); and
- Discovery Meeting Worksheets (Appendix N: *Discovery Meeting Data Worksheets*).

The results of the Discovery meeting breakout sessions with watershed stakeholders are provided in Section V: Discovery Process Outcomes.

V. Discovery Process Outcomes

Table 25: *Summary of the State of Community Floodplain Mapping* and Table 26: *Summary of Community Floodplain Mapping Needs* capture the discussion of needs that took place during the Discovery process. These tables highlight the communities that participated in the planning, provided information on the community data worksheets, and noted specific needs related to their effective FIRMs. Twelve of the 37 communities within the Buffalo-Eighteenmile Watershed provided needs that have also been captured in CNMS.

The main types of needs identified by participants related to the existing FIRMs included:

- Specific unstudied streams in areas of growth and development;
- Old, difficult-to-read maps, due to scale (e.g., several communities have flat fold 11x17 maps and most of the watershed's FIRMs are not yet digital); and,
- Need to establish BFEs on large bodies of water that are currently mapped as approximate flood zones.

Additionally, a summary of community specific priorities, based on discussions and information provided by Discovery process participants, is shown in Table 27: *Summary of Community Priorities*. Appendix N includes the completed Risk MAP questionnaire/Discovery meeting worksheets and stream matrices.

During the Discovery process, stakeholders also noted a need for additional training related to Risk MAP products, floodplain management, and hazard mitigation topics. Table 28: *Summary of Community Training Needs* summarizes these training needs as indicated by specific communities.

Please note that in Table 25 some of the data included in community needs comes from meetings that the NYSDEC held with communities in the watershed that occurred in March of 2005. It should be further noted that some of the data collected during the Discovery process may relate to flood hazard outside the Buffalo-Eighteenmile Watershed. Where applicable, a footnote has been added to identify the watershed name that corresponds with the comment and/or need.

All needs and priorities should be looked at as products of the times that the meetings were held and are subject to update or change.

Recommendations for Future Action

The following summarizes the key findings of this Discovery process:

- There is a lack of existing digital FIRM data in the majority of the watershed; the age and non-digital format of this information can make local floodplain management and mitigation efforts problematic.
- There are a number of existing flood studies prepared by New York State Department of Transportation (NYSDOT) and the USACE which should be acquired and incorporated into FISs for Erie, Genesee and Wyoming Counties as map updates are undertaken.

- Stream extents that have been repeatedly discussed as priority needs as shown in Table 27: *Summary of Community Priorities* include Cazenovia Creek, Tannery Brook, Eighteenmile Creek, Reich Creek, Big Sisters Creek, Muddy Creek, Delaware Creek, Rush Creek, North Branch Slate Bottom Creek, Smoke Creek, Clear Creek, the Buffalo River, the Larkin/Niagara River, and Lake Erie.
- There is a need for Risk MAP product, floodplain management, and hazard mitigation training as identified and shown in Table 28: *Summary of Community Training Needs*.
- There is a general lack of understanding about the CRS program, its benefits, and how to join, which indicates a need for further outreach and training on this topic within the watershed, given its potential benefits.
- While development has been largely subdued, there is a prevalence of smaller developments planned across the watershed. Continued vigilance must be maintained so that as development occurs, good building practices continue for communities within the watershed.

Table 25: Summary of the Status of Community Floodplain Mapping

County	Community	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
Erie	Alden, Town of	2/6/1991	No	Paper	No	No data gathered from community due to lack of participation.			
	Angola, Village of	8/6/2002	Yes	Paper	Yes	Yes	No	No	No
	Aurora, Town of	4/16/1979	Yes	Paper	Yes	Yes	Yes	No	Yes
	Blasdell, Village of	6/25/1976	No	Paper	No	No data gathered from community due to lack of participation.			
	Boston, Town of	9/30/1981	Yes	Paper	Yes	Community Unsure	Yes	No	No
	Brant, Town of	1/6/1984	No	Paper	Yes	No data gathered from community due to lack of participation.			
	Buffalo, City of	9/26/2008	Yes	Digital	Yes	No	No	No	Yes
	Cheektowaga Town of	3/15/1984	No	Paper	No	No data gathered from community due to lack of participation.			
	Colden, Town of	7/2/1979	Yes	Paper	Yes	No	Yes	No	Yes
	Collins, Town of	9/26/2008	No	Digital	Yes	No data gathered from community due to lack of participation.			
	Concord, Town of	9/4/1986	Yes	Paper	Yes	Community Unsure	Yes	No	Yes
	Depew, Village of	8/3/1981	Yes	Paper	Yes	Yes	Yes	No	No

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Table 25: Summary of the Status of Community Floodplain Mapping

County	Community	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
Erie (cont'd)	East Aurora, Village of	8/6/2002	Yes	Digital	Yes	Yes	No	No	No
	Eden, Town of	8/24/1979	No	Paper	No	No data gathered from community due to lack of participation.			
	Elma, Town of	6/22/1998	No	Paper	No	No data gathered from community due to lack of participation.			
	Evans, Town of	2/2/2002	Yes	Digital	Yes	Yes	Yes	No	Yes
	Farnham, Village of	-	Yes	-	Yes	Community Unsure	Yes	No	No
	Hamburg, Town of	12/20/2001	No	Digital	No	No data gathered from community due to lack of participation.			
	Hamburg, Village of	1/20/1982	Yes	Paper	Yes	No	Yes	No	Yes
	Holland, Town of	9/26/2008	Yes	Digital	Yes	Yes	No	No	No
	Lackawanna, City of	7/2/1980	Yes	Paper	Yes	No	No	No	No
	Lancaster, Town of	2/23/2001	Yes	Digital	Yes	Yes	No	No	Yes
	Lancaster, Village of	7/2/1979	No	Paper	No	No data gathered from community due to lack of participation.			
	Marilla, Town of	9/29/1978	No	Paper	No	No data gathered from community due to lack of participation.			
	North Collins, Town of	-	No	-	No	No data gathered from community due to lack of participation.			
	North Collins, Village of	-	No	-	No	No data gathered from community due to lack of participation.			

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Table 25: Summary of the Status of Community Floodplain Mapping

County	Community	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
Erie (cont'd)	Orchard Park, Town of	3/16/1983	Yes	Paper	Yes	Yes	No	No	Yes
	Orchard Park, Village of	9/2/1981	No	Paper	No	No data gathered from community due to lack of participation.			
	Sardinia, Town of	1/16/2003	Yes	Digital	Yes	Yes	Yes	No	Yes
	Sloan, Village of	-	Yes	-	Yes	Yes	No	No	No
	Wales, Town of	9/26/2008	No	Digital	No	No data gathered from community due to lack of participation.			
	West Seneca, Town of	9/30/1992	Yes	Paper	Yes	No	Yes	No	No
Genesee	Darien, Town of	7/6/1984	No	Paper	Yes	No data gathered from community due to lack of participation.			
Wyoming	Arcade, Town of	3/3/1992	Yes	Paper	Yes	Community Unsure	Yes	No	No
	Bennington, Town of	12/23/1983	No	Paper	No	No data gathered from community due to lack of participation.			
	Java, Town of	12/23/1983	No	Paper	No	No data gathered from community due to lack of participation.			
	Sheldon, Town of	12/23/1983	No	Paper	No	No data gathered from community due to lack of participation.			

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Table 26: Summary of Community Floodplain Mapping Needs¹.

County	Community	Summary of Needs
Erie	Town of Alden	<p>NYSDEC 2005 meetings revealed several areas that should be priorities for restudy. The creek-side area tributary to Cayuga Creek and a tributary Zone A area between Kieffer Road and West Alden Road should be restudied using detailed methodology. Ellicott Creek Tributary 3 near the intersection of Buckwheat Road and North Millgrove Road and a tributary north of Kieffer Road should be restudied by approximate methodology.</p> <p>Other areas of slightly lesser priority, that should be studied using approximate methodology, include: Spring Creek, Durkee Creek, Tannery Creek, Cayuga Creek Tributary 2, Cayuga Creek Tributary 4, Cayuga Creek Tributary 5, Cayuga Creek Tributary 8, an unnamed stream in the northeast corner of the town, an unnamed Zone A near Crittenden Street, Ellicott Creek Tributary 12 at North Road and Warren Bippert Pond.</p>
	Village of Angola	No specific comments.
	Town of Aurora	<p>Tannery Brook should be studied.</p> <p>A bridge near main street that was washed out in the 90's, and an area inclusive of 120 feet downhill to the south should be studied.</p> <p>The potential development area at Maple Street near Tannery Brook should be filled in to elevate out potential new properties of the floodplain.</p> <p>A new subdivision, Reed Hill (33 homes), off of Jewitt Holmwood Rd. should be studied so that compliance is ensured.</p> <p>The southeast part of Cazenovia Creek is a flat area with loose soil and bank erosion. This area should be studied and restored.</p> <p>Cazenovia Creek East, south of the village should be studied.</p> <p>NYSDEC 2005 meetings indicated that the Cazenovia Creek, as it impacts the golf course, new development and population dense areas, should be studied.</p>

¹ Information gathered at meetings with communities, held by the New York State Department of Environmental Conservation (NYSDEC) in 2005, is included in this table.

Table 26: Summary of Community Floodplain Mapping Needs¹.

County	Community	Summary of Needs
Erie (cont'd)	Village of Blasdell	NYSDEC 2005 meetings indicated that Rush Creek, as it runs through the village, should be restudied. The stream path on the FIRM may be incorrect.
	Town of Boston	There is survey data available for an unnamed stream on Boston Cross Rd. that should be taken into account on a revised FIRM. A study of the Eighteenmile Creek has been completed and should also be taken into account for a FIRM revision. NYSDEC 2005 meetings indicated that flood-based erosion is a major concern for the community, and should be looked into. The Eighteenmile Creek has changed course in some areas and should be studied and taken into account. Some areas have been filled in or re-landscaped and should be accounted for in any new mapping.
	Town of Brant	No data gathered from Community due to lack of participation.
	City of Buffalo	1997 Cazenovia Creek and Buffalo's First Ward studies are available and should be taken into account for any FIRM revisions. Parts of the community would like to see the Stevenson and Southside historic bridges replaced. A retrofitting project for the Stevenson bridge is to take place in 2016. They have experienced ice jam based flooding and would like to see the areas studied. Flood events have occurred along route 98. This area should be studied. 2005 NYSDEC meetings indicated that the Buffalo Creek and Scajaquada Creek should be restudied. Meetings also showed that residents took issue with flood insurance costs in the south Buffalo area near the Cazenovia Creek, and that Letters of Map Correction (LOMCs) need to be properly accounted for on the FIRM.
	Town of Cheektowaga	NYSDEC 2005 meetings indicated that a levee built in 1981 by the USACE needs to be better accounted for in terms of affecting the BFEs. Particularly at the Seneca Boundary and the boundaries at Union Road and William Street. This levee should be studied, as should Slate Bottom Creek from its confluence with Cayuga Creek to Transit Road. There may also be issues with the accuracy of the mapped floodplain boundary near South Sein Street.

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Table 26: Summary of Community Floodplain Mapping Needs¹.

County	Community	Summary of Needs
Erie (cont'd)	Town of Colden	<p>Updated Hydraulic and Hydrologic studies are available for the area along Rte. 240 and Heath Rd. South of Hamlet, performed by the NYS DOT. There is an erosion problem near the Town Hall. Panel 518 cross-section X, R&S, and at cross-section T stream bank erosion is a concern. These areas should be studied.</p> <p>NYSDEC 2005 meetings indicated that the West Branch of Cazenovia Creek, especially near the Colden Lakes resort, should be restudied.</p>
	Town of Collins	No data gathered from Community due to lack of participation.
	Town of Concord	<p>NYSDEC 2005 meetings indicated that the Eighteenmile Creek from the corporate city limit to approximately 1.2 miles south of Springville Boston Road should be studied by detailed methods. This road has a history of significant flooding, according to community notes.</p> <p>The Cattaraugus Creek, east of Mill Street to west of Scoby Hill should be studied using approximate methods. The creek experiences course changes here and areas of significant flooding have been observed.</p>
	Village of Depew	<p>NYSDEC 2005 meetings indicated that the Scajaquada Creek as it intersects the village should be restudied. There are questions as to the floodplain extents in several areas, and whether or not flood concerns are related to the creek at all. The north branch of the creek is of particular concern.</p> <p>Cayuga Creek should also be looked into, the entirety of its intersection with the village. The community questioned the accuracy of the mapped floodplain extents based upon a levee system, upstream in Lancaster. This could impact potential developments in the western part of the village. The community believes that Zone A4 is overstated. There is some concern that Zurbrick Road could be washed out during a flooding event as it has been flagged as having an erosion problem that may need restoration and certainly requires study. The road elevation is 15-20 feet higher than the creek.</p>
	Village of East Aurora	<p>Tannery Brook should be studied.</p> <p>A bridge along Tannery Brook near main street that was washed out in the 1990's. This area and an area inclusive of 120 feet downstream to the south should be studied.</p>
	Town of Eden	<p>NYSDEC 2005 meetings indicated that the Rythus Creek needs to be re-delineated.</p> <p>The south branch of the Eighteenmile Creek from Bley Road to Rte. 62 should be studied.</p>

Table 26: Summary of Community Floodplain Mapping Needs¹.

County	Community	Summary of Needs
Erie (cont'd)	Town of Elma	<p>NYSDEC 2005 meetings indicated that Pond Brook from Rice Road to the corporate city limit needs to be restudied using a detailed methodology.</p> <p>Buffalo Creek, especially the area around the intersection of Windspear Road and Transit Road also require detailed study, the floodplain may be under estimated in this area.</p>
	Town of Evans	<p>Reich Creek needs to be restudied, using detailed methodology. The drainage for the Creek has changed since the effective FIRM. Muddy Creek should also be subject to a detailed study due to erosion problems.</p> <p>Big Sisters Creek and Delaware Creek may also need to be studied. Big Sisters Creek is known to flood due to ice jams especially along Bennett Road.</p>
	Village of Farnham	No specific comments.
	Town of Hamburg	<p>There is a USACE study of Rush Creek that should be accounted for in mapping.</p> <p>NYSDEC 2005 meetings indicated that Waterfalls Village Creek and Foster Brook, as they appear in FIRM panel 5 require a detailed study. The existing map does not reflect changes from a NYSDOT project. There is a proposed development in a currently mapped AE Zone.</p> <p>Berricks Creek also requires a detailed study. The community notes that this is the most flood prone area in town. The areas around Camp Road and the railroad are subject to flooding and are of particular note. Berricks Road and Elmview are areas that are said not to flood.</p> <p>Rush Creek too should be studied using a detailed methodology. The accuracy of the mapped Zone A on Panel 14 is questionable.</p> <p>The Eighteenmile Creek should be restudied using an approximate methodology. Zone A may need to be re-delineated.</p> <p>The unnamed tributary to Rush Creek also requires a study using an approximate methodology. The community believes that the floodplain extents are exaggerated.</p>

Table 26: Summary of Community Floodplain Mapping Needs¹.

County	Community	Summary of Needs
Erie (cont'd)	Village of Hamburg	<p>The County bridge replacement, Main Street restoration project, Forest Glen residential development, and possible USACE studies for Rush Creek all need to be taken into account for FIRM revision.</p> <p>Priorities for the community include obtaining and incorporating the information from hydraulic and hydrologic studies that may have been done by various stakeholders and LWRP bridge replacements for the Eighteenmile Creek, Rush Creek, a tributary to the Buffalo River, and Larkin/Niagara River.</p> <p>NYSDEC 2005 meetings indicated that Berricks Creek should be restudied in the vicinity of Sunset Drive.</p>
	Town of Holland	No specific comments.
	City of Lackawanna	<p>NYSDEC 2005 meetings indicated that the Lake Erie shoreline should be re-delineated.</p> <p>Smoke Creek and its south branch have studies which should be accounted for in mapping. Topographical restudy is needed, however to meet FIS requirements.</p>
	Town of Lancaster	<p>A subdivision near the north branch of Slate Bottom Creek requires a detailed study, as it was built before the 5 acre rule went into effect.</p> <p>The Ellicott Creek floodplain along Stony Road where old homes are located also requires study.</p> <p>NYSDEC 2005 meetings indicated that Cayuga Creek, from Bowan Road to Schwartz Road require restudy due to two new bridges and a dam. This area is subject to development and new data is essential.</p> <p>The north and south branches of Plum Bottom Creek is also an area subject to development and requires detailed data.</p> <p>Plum Bottom Creek, from Cemetery Road to Radison Road, is another area subject to development requiring detailed data.</p> <p>Spring Creek, from the village boundary to Pavement Road, is yet another area subject to development requiring detailed data.</p> <p>Ellicott Creek, Alden Town Road to Pavement Road BFEs may need to be looked into.</p> <p>Little Buffalo Creek from its confluence with Cayuga Creek to 1200 feet upstream of Schwartz Road needs to be looked at for a gap in the mapping.</p>
	Village of Lancaster	No data gathered from community due to lack of participation.

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Table 26: Summary of Community Floodplain Mapping Needs¹.

County	Community	Summary of Needs
Erie (cont'd)	Town of Marilla	NYSDEC 2005 meetings indicated that a detailed study of Little Buffalo Creek, from the corporate limits to its confluence with the tributary is necessary. There is a question as to whether ice jams are causing flooding, so that accurate, current conditions aren't being taken into account. Buffalo Creek, from 800 feet from Two Rod Road to the corporate limit also requires a detailed study.
	Town of North Collins	No data gathered from community due to lack of participation.
	Village of North Collins	NYSDEC 2005 meetings indicated that Big Sister Creek tributary 4, from west to east corporate limits, needs to be restudied using approximate methodology. A tributary to Big Sister Creek Tributary 4 from 150 feet west of Rte. 62 to Valone Avenue requires a restudy using approximate methodology.
	Town of Orchard Park	A detailed study is required along Eighteenmile Creek and Smoke Creek bridge on S. Abbott Road. Further, bridges along Baker Road, Lake Ave., and Highland Ave. require detailed studies along Eighteenmile Mile Creek and Smoke Creek. NYSDEC 2005 meetings indicated that Rush Creek needs a detailed study due to heavy development pressure. Three streams from Big Tree Road to Armor Duells Corner Road are current not studied and should be. The northeast branch of Smoke Creek needs a detailed study from the confluence of the northwest branch of Smoke Creek to a point 4.9 miles upstream. An unnamed creek in the southeast of town has not been studied and should be. The floodplain needs to be verified for the northeast branch of Smoke Creek, from Freeman Road to Holmwood Road, as stream channels have changed. Neuman Creek, from the town limits to Scherff Road should be studied using a limited detail study by request of the town in order to verify the Zone A designation.
	Village of Orchard Park	NYSDEC 2005 meetings indicated that two bridge replacements on the northwest and south branches of Smoke Creek, as well as significant changes in development represent a need for a new hydrological study.
	Town of Sardinia	The areas around proposed residential and business parks should be studied.
	Village of Sloan	Sloan experiences mild flooding in periods of heavy rain, often in excess of 3 inches during a short timeframe. This may be due to a piped underground stream running diagonally through the center of the village on an East/South direction. This stream should be studied.
	Town of Wales	No data gathered from community due to lack of participation.

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Table 26: Summary of Community Floodplain Mapping Needs¹.

County	Community	Summary of Needs
Erie (cont'd)	Town of West Seneca	Buffalo Creek should be restudied in the areas of the following subdivisions: Lexington Green Subdivision, Clinton St near Harlem Rd., Casemir Subdivision near Cazenovia Creek, Parkside Dr. Subdivision, Mill Rd, Orchard Park Rd., Seneca St and all subdivisions off Seneca St. into city line area. Smoke Creek near Langner and Fisher Roads should be studied. Buffalo Creek requires a detailed study and the removal of deposited gravel. The study is necessary due to the past ice jam flooding and need for the bank stabilization. Cazenovia Creek requires a limited detail study, and removal of deposited gravel. More than 70 homes have been affected by recent flooding events. NYSDEC 2005 meetings indicated that Ebenezer Brook, from its confluence with Cazenovia Creek to State Rte. 277/Union Road needs a restudy. This restudy is requested due to recent flooding.
Genesee	Town of Darien	Genesee County as a whole notes that Zone A has been mapped poorly county-wide resulting in many LOMAs. This should be looked into.
Wyoming	Town of Arcade	Clear and Cattaraugus Creeks both require study.
	Town of Bennington	No data gathered from community due to lack of participation.
	Town of Java	No data gathered from community due to lack of participation.
	Town of Sheldon	No data gathered from community due to lack of participation.

Table 27: Summary of Community Priorities

County	Community	Priorities
Erie	Town of Alden	No data gathered from community due to lack of participation
	Village of Angola	No specific comments.
	Town of Aurora	Tannery Brook should be studied. The south-east part of Cazenovia Creek is a flat area with loose soil and bank erosion. This area should be studied and restored. Cazenovia Creek East, south of the village should be studied.
	Village of Blasdell	No data gathered from community due to lack of participation.

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Table 27: Summary of Community Priorities

County	Community	Priorities
Erie (cont'd)	Town of Boston	There is survey data available for an unnamed stream on Boston Cross Rd. that should be taken into account on a revised FIRM. A study of the Eighteenmile Creek has been completed and should also be taken into account for a FIRM revision.
	Town of Brant	No data gathered from community due to lack of participation.
	City of Buffalo	1997 Cazenovia Creek and Buffalo's First Ward studies are available and should be taken into account for any FIRM revisions. Parts of the community would like to see the Stevenson and Southside historic bridges replaced, though a retrofitting project for the Severson bridge is taking place in 2016, they have experienced ice jam based flooding and should be studied.
	Town of Cheektowaga	No data gathered from community due to lack of participation.
	Town of Colden	An updated Hydraulic and Hydrologic studies are available for the area along Rte. 240 and Heath Rd. South of Hamlet, performed by the NYS DOT. There is an erosion problem near the Town Hall. Panel 518 cross-section X, R&S, and at cross-section T stream bank erosion is a concern. These areas should be studied and possibly recovered.
	Town of Collins	No data gathered from community due to lack of participation.
	Town of Concord	No specific comments.
	Village of Depew	No specific comments.
	Village of East Aurora	Tannery Brook should be studied. A bridge near main street that was washed out in the 90's, and an area inclusive of 120 feet downhill to the south should be studied.
	Town of Eden	No data gathered from community due to lack of participation.
	Town of Elma	No data gathered from community due to lack of participation.
	Town of Evans	Reich Creek needs to be restudied, using detailed methodology. The drainage for the Creek has changed since the effective FIRM. Muddy Creek should also be subject to a detailed study due to erosion problems.
	Village of Farnham	No specific comments.
	Town of Hamburg	No data gathered from community due to lack of participation.
	Village of Hamburg	The County Bridge replacement, Main Street restoration project, Forest Glen residential development, and possible USACE studies for Rush Creek all need to be taken into account for FIRM revision.

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Table 27: Summary of Community Priorities

County	Community	Priorities
Erie (cont'd)		Priorities for the community include obtaining and incorporating the information from hydraulic and hydrologic studies that may have been done by various stakeholders and LWRP bridge replacements for the Eighteenmile Creek, Rush Creek, a tributary to the Buffalo River, and Larkin/Niagara River.
	Town of Holland	No specific comments.
	City of Lackawanna	No specific comments.
	Town of Lancaster	A subdivision near the north branch of Slate Bottom Creek requires a detailed study, as it was built before the 5 acre rule went into effect. The Ellicott Creek floodplain along Stony Road where old homes are located also requires study.
	Village of Lancaster	No data gathered from community due to lack of participation.
	Town of Marilla	No data gathered from community due to lack of participation.
	Town of North Collins	No data gathered from community due to lack of participation.
	Village of North Collins	No data gathered from community due to lack of participation.
	Town of Orchard Park	A detailed study is required along 18 Mile Creek and Smoke Creek bridge on S. Abbott Rd. Bridges along Baker Road, Lake Ave., and Highland Ave. require detailed studies along 18 Mile Creek and Smoke Creek.
	Village of Orchard Park	No data gathered from community due to lack of participation.
	Town of Sardinia	The areas around proposed residential and business parks should be studied.
	Village of Sloan	Sloan experiences mild flooding in periods of heavy rain, often in excess of 3 inches. This may be due to an underground stream running through the center of the village. This stream should be studied.
	Town of Wales	No data gathered from community due to lack of participation.
	Town of West Seneca	Buffalo Creek should be restudied in the areas of the following subdivisions: Lexington Green Subdivision, Clinton St. near Harlem Rd., Casemir Subdivision near Cazenovia Creek, Parkside Dr. Subdivision, Mill Rd., Orchard Park Rd., Seneca St. and all subdivisions off Seneca St. into city line area.

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Table 27: Summary of Community Priorities

County	Community	Priorities
Erie (cont'd)		Smoke Creek near Langner and Fisher Roads should be studied. Buffalo Creek requires a detailed study and the removal of deposited gravel. The study is necessary due to the past ice jam flooding and need for the bank stabilization. Cazenovia Creek requires a limited detail study, and removal of deposited gravel. More than 70 homes have been affect by recent flooding events.
Genesee	Town of Darien	No data gathered from community due to lack of participation.
Wyoming	Town of Arcade	Clear and Cattaraugus Creeks both require study.
	Town of Bennington	No data gathered from community due to lack of participation.
	Town of Java	No data gathered from community due to lack of participation.
	Town of Sheldon	No data gathered from community due to lack of participation.

Table 28: Summary of Community Training Needs

COUNTY	COMMUNITY	TRAINING NEEDS
Erie	Town of Alden	No data gathered from community due to lack of participation.
	Village of Angola	No training requested.
	Town of Aurora	Other: Understand resources and how to access them.
	Village of Blasdell	No data gathered from community due to lack of participation.
	Town of Boston	Floodplain Management Training RiskMap Product Training Hazard Mitigation Training
	Town of Brant	No data gathered from community due to lack of participation.
	City of Buffalo	No training requested.
	Town of Cheektowaga	No data gathered from community due to lack of participation.
	Town of Colden	Floodplain Management Training Risk Map Product Training Hazard Mitigation Training Building and Enforcement Guidance
	Town of Collins	No data gathered from community due to lack of participation.
	Town of Concord	Hazard Mitigation Training Building and Enforcement Guidance
	Village of Depew	Floodplain Management Training Hazard Mitigation Training
	Village of East Aurora	No training requested.
	Town of Eden	No data gathered from community due to lack of participation.
	Town of Elma	No data gathered from community due to lack of participation.
	Town of Evans	No training requested.
	Village of Farnham	Floodplain Management Training Risk Map Product Training Hazard Mitigation Training Building and Enforcement Guidance
	Town of Hamburg	No data gathered from community due to lack of participation.
	Village of Hamburg	Floodplain Management Training Risk Map Product Training Hazard Mitigation Training Building and Enforcement Guidance

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Table 28: Summary of Community Training Needs

COUNTY	COMMUNITY	TRAINING NEEDS
Erie (cont'd)	Town of Holland	No training requested.
	City of Lackawanna	No training requested.
	Town of Lancaster	No training requested.
	Village of Lancaster	No data gathered from community due to lack of participation.
	Town of Marilla	No data gathered from community due to lack of participation.
	Town of North Collins	No data gathered from community due to lack of participation.
	Village of North Collins	No data gathered from community due to lack of participation.
	Town of Orchard Park	No training requested.
	Village of Orchard Park	No data gathered from community due to lack of participation.
	Town of Sardinia	Floodplain Management Training
	Village of Sloan	No training requested.
	Town of Wales	No data gathered from community due to lack of participation.
	Town of West Seneca	Floodplain Management Training Risk Map Product Training Hazard Mitigation Training Other: Assistance in getting USACE to finish study along Buffalo Creek.
Genesee	Town of Darien	No data gathered from community due to lack of participation.
Wyoming	Town of Arcade	No training requested.
	Town of Bennington	No data gathered from community due to lack of participation.
	Town of Java	No data gathered from community due to lack of participation.
	Town of Sheldon	No data gathered from community due to lack of participation.

VI. Risk MAP Projects and Needs

FEMA's Risk MAP program 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 mitigation programs and actions.

Coastal Studies

As discussed in the Overview section of this report, Coastal flood hazard analyses and mapping will be performed for some communities along the shoreline of Lake Erie as a part of the GLCFS. This study will produce revised 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 existing study and effective FISs 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 Guidelines and Standards (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 Erie shoreline and areas subject to coastal flooding or more recent requirements depending on the date of contract and requirements current at the time. 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 Erie 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 landward limits of the Limit of Moderate Wave Action (LiMWA)² 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 wave run up or storm surge, whichever is higher.

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 Area (Zone VE), BFEs, and LiMWA. Communities will be provided with an opportunity to review the work maps after the coastal modeling is complete and before FEMA moves forward with updated coastal flood maps.

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 Erie 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.

Regulatory Considerations

Coastal Special Flood Hazard Areas

The Lake Erie Coastal Flood Study analysis may result in new SFHAs, or areas that will be inundated by a flood event having a 1-percent annual 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.

² Please see pg. 69 for more information pertaining to LiMWA

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.

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 NFIP minimum requirements for buildings constructed in Zone VE (Coastal High Hazard Areas) 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 at or above the BFE, with NYSDEC requiring a minimum of 2 feet above the BFE.
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.
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 and New York State requirements described above.

LiMWA

Post-storm field investigations and laboratory tests have confirmed that waves heights as low 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 breaking 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 breaking by waves 1.5 feet to just below 3.0 feet. 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 11 depicts the LiMWA zone location.

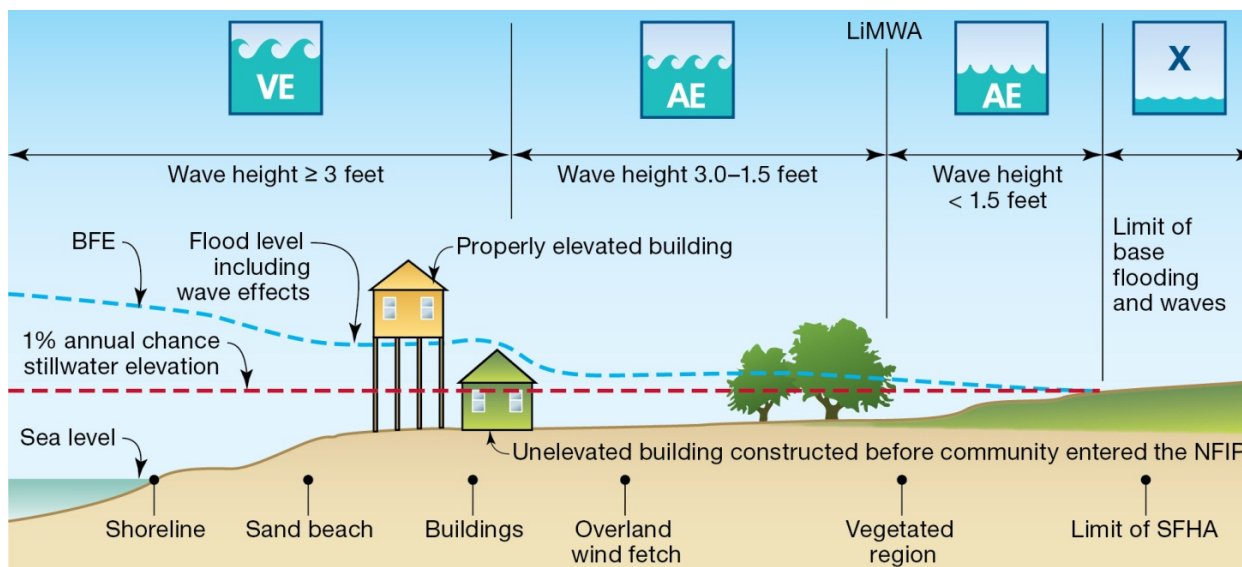


Figure 11: Limit of Moderate Wave Action

A new line layer will be added to the FIRM Database to accommodate the LiMWA features. The new layer will also be depicted on updated FIRM panels. 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 12 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 the delineation of the LiMWA in a region where the major coastal flood hazard is breaking waves and wave runoff. The triangles along the LiMWA line point toward the source of the breaking waves.

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 must 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. Additional information on CRS can be found [online](#).

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. When a LiMWA has been mapped, specific building codes may apply lakeward of the line.

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.

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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, the 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 [Procedure Memorandum No. 50](#) and [Operating Guidance No. 13-13](#).

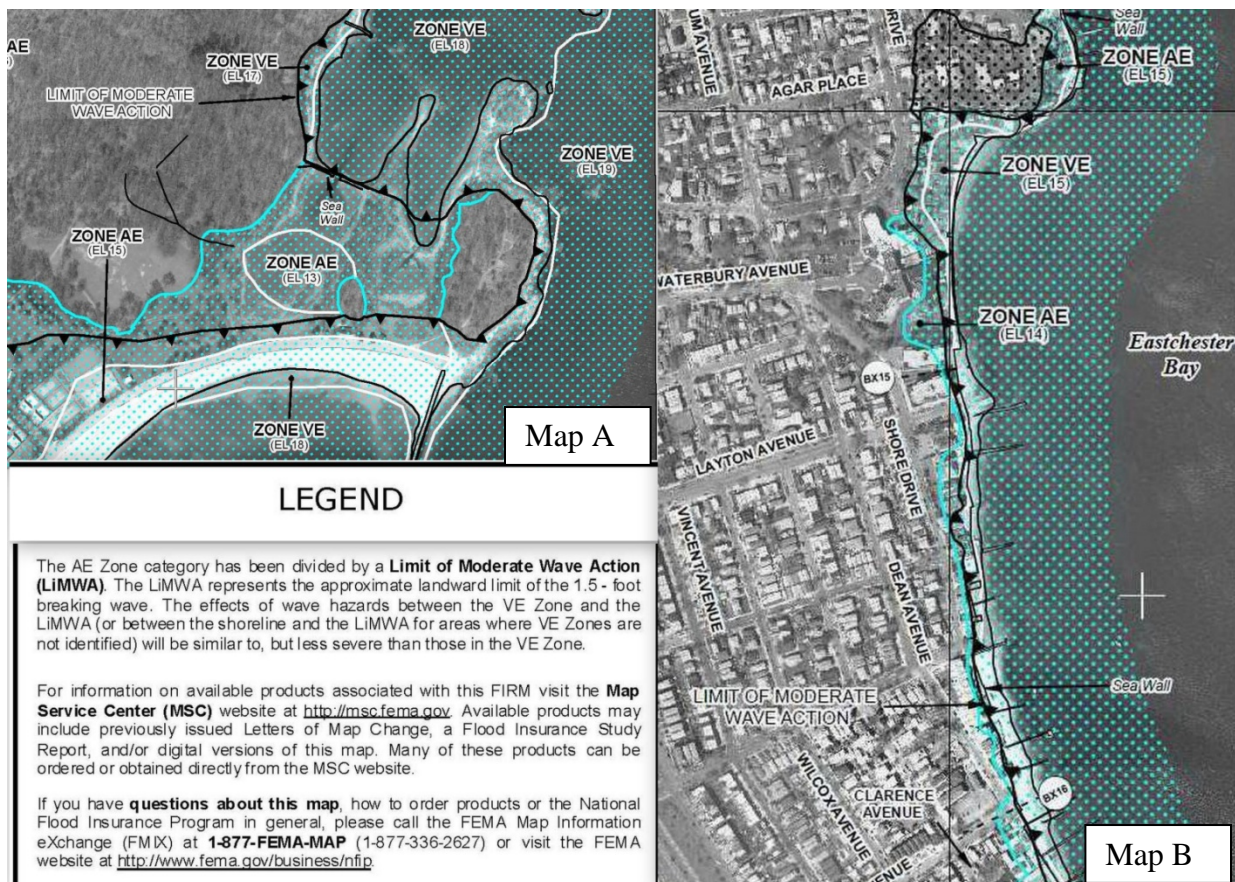


Figure 12: Example FIRM Showing LiMWA

VII. Conclusion

All communities within the Buffalo-Eighteenmile Watershed, with the exception of those included in the partial countywide FIRM for Erie County, do not yet have effective FIRMs in digital format. These communities have expressed concern with current map accuracy, paper products, and lack of information to make accurate floodplain management determinations. As note in Section I - Other Flood Studies of this Report, a comprehensive countywide digital FIS has been prepared for Erie County. This FIS includes updated flood hazard information for over twenty flooding sources in the county. Until that FIS becomes effective, FEMA encourages communities to “reasonably utilize” the updated flood hazard information and digital mapping for floodplain management purposes as outlined in FEMA Floodplain Management Bulletin 1-98: [*Use of Flood Insurance Study \(FIS\) Data As Available Data*](#).

While development is largely subdued in the Buffalo-Eighteenmile Watershed, several communities noted areas of development pressure within their SFHAs. Specifically, the Town of Lancaster noted several areas experiencing development pressure along Cayuga Creek, Plum Bottom Creek, and the north and south branches of Plum Bottom Creek. The Town of Orchard Park and the Village of Orchard Park also noted heavy development pressure along Rush Creek and Smoke Creek, respectively. Local officials in all areas of the watershed need to be aware of the NFIP and state minimum building standards that apply to all construction in the SFHA and remain vigilant as the economy improves and development pressure increases. Information on the NFIP’s building requirements in the SFHA can be found in Attachment 2: [*Floodplain Construction Requirements in New York State*](#).

Numerous communities made note of stream bank erosion and streams that have changed course and are incorrect on the effective FIRM. Specific areas of concern to local communities include Eighteenmile Creek in the Town of Boston, Rush Creek in the Village of Blasdell, and Muddy Creek in the Town of Evans.

Communities including the City of Buffalo and towns of Colden and Hamburg also noted that flood studies have been completed in their communities and should be incorporated into the FIRMs. Several of the studies noted were conducted to reflect the effects of NYSDOT projects. Other projects and possible studies available for inclusion include one for Rush Creek in the Village of Hamburg completed by the USACE.

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 Cazenovia Creek, Tannery Brook, Eighteenmile Creek, Reich Creek, Big Sisters Creek, Muddy Creek, Delaware Creek, Rush Creek, North Branch Slate Bottom Creek, Smoke Creek, Clear Creek, the Buffalo River, the Larkin/Niagara River, and Lake Erie.

As stated previously, joining the NFIP’s CRS program would be greatly beneficial to the communities in the watershed. All efforts should be made to educate the communities and have them working on taking the necessary steps toward participation where feasible.

VIII. Deliverables

Communications (Supporting materials available in Appendices C, and H-M)

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 (Supporting materials available in Appendix N)

Community Data Worksheets

Discovery Meeting (Supporting materials available in Appendices K-N)

Agenda

Presentation

Sign-In Sheet

Discovery Meeting Map

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.

IX. References

Federal Emergency Management Agency, www.fema.gov

FEMA, Map Service Center. <https://msc.fema.gov/portal>.

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

FEMA, Disasters, <http://www.fema.gov/disasters>.

FloodSmart, the official site of the National Flood Insurance Program (NFIP):
www.floodsmart.gov

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

National Weather Service Ice Jam Information:
<http://www.weather.gov/media/aly/Hydrology/IceJamInfo.pdf>

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

NFIP Reform: www.fema.gov/bw12

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

U.S. Census Bureau, 2010, State and County Quick Facts, <http://quickfacts.census.gov/>,
accessed November 2014.

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>

U.S. Department of Agriculture, New York Rapid Watershed Assessment Profile:
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/ny/technical/dma/rwa/>

USDA 2007 Census of Agriculture:
<http://www.agcensus.usda.gov/Publications/2007/index.php>