

Appendix C: The Flood Smart Approach

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Introduction

The *Flood Smart Communities* approach is supported by four pillars:

- Action-oriented strategies
- Informed by an inter-disciplinary team of planners, lawyers, and scientists
- Developed in collaboration with the community, with
- Effective monitoring of implementation.

To uphold these pillars, our approach incorporates a formal decision making process with community-specific assessments and follow-up evaluation of success. The six steps of the approach (Fig. 1) were developed to be followed in order beginning with “Identifying the Problem,” and revisited and updated regularly throughout the process. Action-oriented recommendations are developed in step 5 after the community study has been completed by the Study Team of multi-disciplinary experts in step 4. Strategies reflect the situation, needs and concerns of the specific communities that are gathered in steps 1 through 3. Step 6 measures the progress the communities make towards implementing the recommendations and how effective the recommendations are at reducing flooding vulnerability.

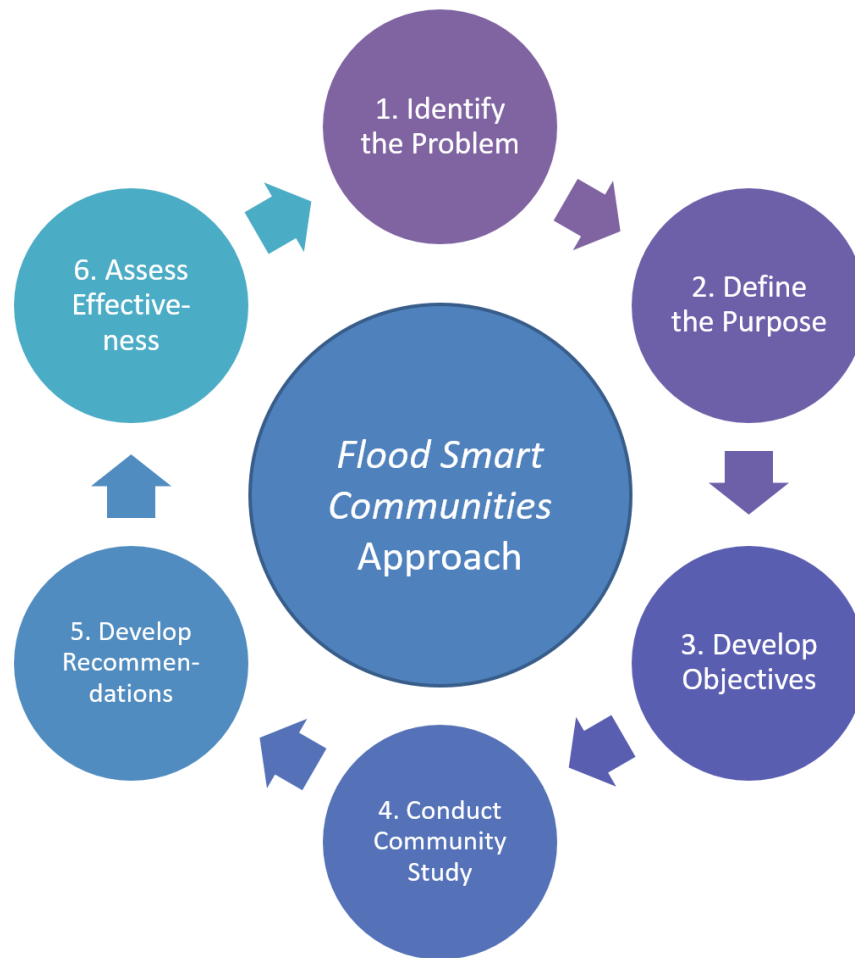


Figure 1. The six steps of the Flood Smart Communities approach.

Flooding is a complex problem that involves wide-ranging causes, impacts, and stakeholders. In order to divide the problem and the decision making process into manageable components, the Study Team, The Nature Conservancy (TNC), Genesee/Finger Lakes Regional Planning Council (G/FLRPC), and University of Buffalo, Regional Institute (UBRI)¹ put together an approach loosely based on Structured Decision-Making² with components of Open Standards³, a conservation action planning process. The resulting process and outcomes are transparent, explicit, and documented so that those not participating in the process directly (elected officials and the public) can understand how the final recommendations were selected and why. Documentation of each step and the products are described so that this approach can be used by others for tackling this and other types of risk reduction problems.

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² Gregory, R., L. Failing, M. Harstone, G. Long, T. McDaniels and D. Ohlson. 2012. Structured decision making: A practical guide to environmental management choices. Chichester, West Sussex, UK: Wiley-Blackwell.

³ The Nature Conservancy. 2007. Conservation action planning handbook: developing strategies, taking action and measuring success at any scale. The Nature Conservancy, Arlington, VA.

Stakeholders impacted by flooding were narrowed to two main groups: local government and property owners. The second group was further divided into residential, businesses and agriculture.

Local government decision makers were engaged in the full formal process through a series of in-person meetings while information that could inform local government decisions was collected from the three property owner groups using a variety of methods ([see Appendix B](#)).

The following municipal representatives of local government decision makers were identified for participation through discussions with Town of Greece, Village of Hilton, and Town of Parma:

- Scott Copey, Planner, Town of Greece
- Paul Czapranski, Technical Services Coordinator, Town of Greece
- John Gauthier, Engineer and MS4 permit manager, Town of Greece
- Sue Duggan, Assistant to the Building Inspector, Town of Greece
- Mike Lissow, Code Enforcement Officer, Building Inspector and Fire Marshall, Village of Hilton
- Mike McHenry, Public Works Superintendent, Village of Hilton
- Dennis Scibetta, Building and Development Coordinator, Town of Parma
- Jack Barton, Retired Code Enforcement Officer for the Town of Parma.

A series of in-person meetings were held with municipal representatives from November 2014 through April 2016 to work through the *Flood Smart Communities Approach*. Below are explanations of each step of the process (Fig. 1) and the resulting products.

Step 1. Identify the Problem

Defining the problem and decision is an important step of complex decision-making. It is necessary to ensure that all participants have a clear and shared understanding of the flooding problem; what is driving the need to make the decision; what solutions will best address the unique issues faced by each community; and which actions are within their power to implement.

To develop a shared understanding of the flooding problem faced by the three communities, a situation analysis from Open Standards was modified from a primarily conservation-oriented practice to one that would fit a socio-ecological focus. On November 12, 2014, the Study Team worked with the municipal representatives to characterize the type of flooding experienced by their communities and identify the impacts and causes. The Study Team then molded the information into a conceptual model or relationships diagram to provide a shared understanding of flooding for Greece, Parma and Hilton (Fig. 2).

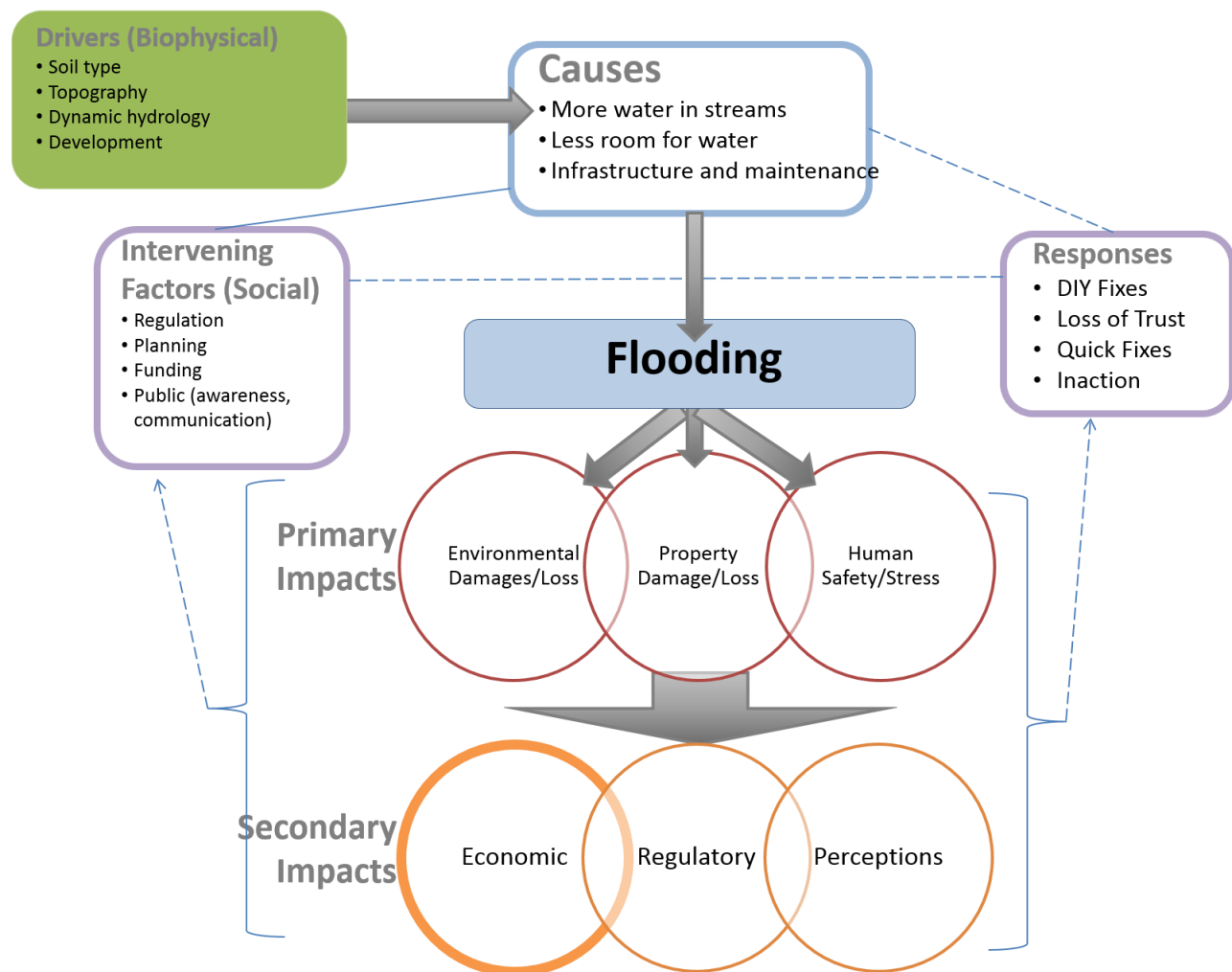


Figure 2. Summarized Relationships Diagram

The information was also summarized into the following findings that provide a broad picture of flooding in these communities.

The reasons the municipal governments of Greece, Parma and Hilton care about flooding:

- Risk to safety of people including emergency responders
- Damage to structures and property
- Loss of business and access to businesses
- Interruption of utilities and public services
- Limited financial resources for both municipalities and residents to cover flood response, recovery, and mitigation
- Both municipalities and residents are losing money due to missed work and decrease in property values
- Repercussions to the tax base, tax increases, and costs to develop
- Increased regulations fall to municipalities with limited capacity to implement and enforce them
- Water quality problems (sediment and nutrient delivery to streams and ponds).

Causes of flooding and contributing components that are an issue in these communities:

- Too many impervious surfaces
- Incomplete and out-of-date data and maps
- Too much reliance on mitigation of development as solution (regulations are moving target)
- Cross connections/do-it-yourself fixes
- Risky land use in floodplain properties
- Filling of floodplains
- Insufficient federal and state regulations (minimum standards)
- Floodplains and wetlands are not adequately protected by state and federal regulations
- Undersized conveyance
- Aging infrastructure
- Lack of funding for stream maintenance
- No approved stream maintenance plan

Greece, Parma and Hilton identified the following mechanisms to reduce the causes and impacts of flooding:

- Collaborative floodplain planning and management
- Raising public awareness
- Regulations that are enforced, enforceable, and above and beyond the minimum standards
- Finding or providing funding.

Step 2. Define the Purpose

Constructing a statement about the purpose of the work and the decision to be made provides a clear understanding of which components of the problem the project can address and how it can best address them. UBRI interviewed eight municipal representatives to learn more about their specific concerns and barriers to floodplain management both within their jurisdictions and with upstream/downstream municipalities. This information was used to draft a decision statement which was then reviewed and modified by the local government representatives on January 14, 2015 and accepted as the project's **Statement of Purpose**.

Statement of Purpose

A coordinated approach to floodplain management is desirable in the Village of Hilton, Town of Parma and Town of Greece to:

- *protect life, health and property against flooding damage;*
- *minimize municipal costs related to flooding;*
- *reduce the financial burden of flood impacts and insurance on property owners;*
- *shorten business interruptions caused by flooding;*
- *keep an eye towards improving water quality with floodplain management strategies; and*
- *promote collaborative, strategic floodplain development and management.*

Recently, leadership in our communities recognized that their capacity to jointly manage flood risk could be strengthened. This decision stems from dynamic hydrologic cycles in their shared watersheds, regulatory requirements, inadequate infrastructure, and traditional independent management practices, which do not adequately address new flooding challenges. A multi-jurisdictional template for collaborative floodplain management planning will be developed to operate within a legal and regulatory framework that includes FEMA, NFIP, and New York State Home Rule. Municipalities will work with public agencies and private sector interests to proactively address flooding impacts. A template Floodplain Management Plan will be proposed in 2016. It is intended to serve as the foundational document for future decisions, which will be cumulative and build upon each other. Although sustainable floodplain management in these communities is broad and complicated, this collaborative, strategic approach would serve to guide long-term decision making and action.

Step 3. Develop Objectives

The communities next articulated the objectives that they wanted to achieve as the outcomes of their actions. These objectives became the criteria against which potential recommendations were weighed. They are simple statements with a desired direction of movement, such as “to reduce” or “to maximize.” The Study Team agreed to use this format for three reasons: (1) it provides a transparent trail for how recommendations were selected; (2) with general or simple objectives, creative solutions and alternatives are not limited; and (3) it helps decision-makers understand how each recommendation meets one or more objectives, or possibly how it’s the only or most efficient way to meet an objective.

In February 2015, the Study Team worked with the municipal representatives to articulate their concerns and wishes and convert them into objectives. The municipal representatives and the Study Team continued to revise the objectives with input from the Project Advisory Committee (PAC) (see [Section 3](#) of the main plan for a list of members).

They will minimize economic impacts to the local governments from flooding by maximizing intermunicipal collaboration and shared services, minimizing the cost and maintenance of flood attenuation solutions, and minimizing unscheduled interruptions of staff time. By working together and sharing, more can be accomplished with fewer resources. Many hands make light work. By protecting natural infrastructure that is currently providing flood attenuation benefits and implementing small prioritized projects, they can reduce the need for expensive engineered solutions. By planning and taking proactive action, communities will be more prepared and resilient to flooding so that when those events occur staff will be better prepared and have the resources they need.

They will take action to minimize damage to property owners by improving flood-related development standards; appropriately siting development out of high risk areas; codifying existing decision making so that it can consistently be applied; protecting wetlands so they continue to provide flood attenuation benefits; increasing understanding of high risk areas, what causes them, and how they can be mitigated; and keeping people away from flooding by maintaining stream and wetland buffers.

They will maximize multiple benefits of flood attenuation solutions so that they reduce sediment and nutrient delivery to streams, reduce sediment delivery to Braddock Bay, and reduce impact of debris in streams.

They will maximize long-term, collaborative floodplain management by planning for the long-term and implementing those plans, finding or creating a sustainable funding stream to implement plans, measuring the effectiveness of both implementing the plans and implemented actions, and by demonstrating the benefits of this type of floodplain management approach.

Step 4. Conduct Community Study

Collecting baseline information about the communities added depth and richness to the description of the problem, and provided a foundation of information with which to make decisions. The community study was comprised of a number of components that are described in detail in other appendices with highlights and key messages described in the main body of the plan.

Appendix A: Existing Conditions

- Baseline demographics, land use, master plans, land use laws, stormwater management
- Baseline natural environment – groundwater, precipitation, topography and geology, development, stream flow, and natural infrastructure

Appendix B: Assess the Problem

- Barriers to inter-municipal collaboration
- Sector assessment - Residential, Agriculture
 - Residential property owner survey
 - Agriculture economic assessment and exposure
- Vulnerability Assessment
 - Indicators of social, economic, structural, and physical susceptibility
 - Hot spots of vulnerability
- BCA/ImPLAN
 - Costs of impacts and possible mitigation measures
 - Inclusion of economic information into benefit-cost ratio

By reviewing existing planning documents and land use laws, gaps were identified and areas to strengthen were determined. The municipal reps determined drivers of flooding when they conducted their situation analysis: soils, topography, hydrology and existing development. The Study Team then investigated these characteristics of the landscape that cannot be changed, but that can be accommodated. Having a more thorough understanding of them helped identify areas of particular susceptibility and limits of actions that can be taken.

Assessing the problem more deeply by analyzing economic and social impacts, evaluating the costs and benefits of mitigation measures and mapping areas of vulnerability has helped develop recommendations that are much more specific to geographic areas and needs of the community.

Step 5. Develop recommendations

The Project Team developed a range of creative policy and management recommendations to address the objectives and provide solutions to the flood problem. Final recommendations were intentionally wide-ranging to present different approaches to the problem, but were meant to provide decision makers with real options and choices.

Based on findings from the Community Study, the Study Team drafted possible actions or recommendations as a starting place for discussion with the municipal representatives. A meeting was held on April 13, 2016 to identify gaps and narrow the list of possibilities to only those that the municipal representatives felt met the objectives. Recommendations were then prioritized for each of the municipalities.

Three recommendations were clearly identified as priorities for all three municipalities.

1. Convene formal work group that reviews progress towards implementation of Flood Smart Action Plan, and works to build and maintain intermunicipal partnership and collaboration.

The municipal representatives identified a real need to meet regularly to maintain forward momentum with the Flood Smart Action Plan. They will meet twice per year to implement actions identified in the recommendations and document effectiveness.

Participants are:

- Scott Copey, Planner, Town of Greece
- John Gauthier, Engineer and MS4 permit manager, Town of Greece
- Sue Duggan, Assistant to the Building Inspector, Town of Greece
- Mike Lissow, Code Enforcement Officer, Building Inspector and Fire Marshall, Village of Hilton

Topics that were identified that the group could work on:

- Identify priority topics for Board training. Organize and hold the trainings.
- Identify a role for the municipalities in convening agricultural interests.
- Identify priority shared projects.
- Work with local land trusts to acquire highest priority floodplains/wetlands.
- Research mapping options, select one, find funding source to complete.
- Determine best host for online mapper that will make geospatial data available to each muni and the public. Determine plan for regularly updating the data.
- Work together to educate residents of flood prone neighborhoods in NFIP, Biggert Waters, mitigation options and FEMA mitigation programs.
- Collaboratively develop mailings to floodplain residents regarding location in floodplain, flood insurance and keeping debris out of streams.
- Get actions incorporated into Monroe County Hazard Mitigation Plan.
- Assess need for revised roadside ditch best management practices and other training for road crews like the Emergency Stream Intervention Training.
- Reach out to human health, social justice or disadvantaged community organizations to develop effective emergency planning and response outreach.

- Mike McHenry, Public Works Superintendent, Village of Hilton
- Dennis Scibetta, Building and Development Coordinator, Town of Parma
- Town of Parma Highway Department representative
- A representative from each municipal Board
- A representative from each Planning Board

2. Develop training requirement and/or program to ensure boards are aware of risks of land use decisions related to flooding.

Training topics will be developed by the Work Group and offered to board members as part of the continuing education requirement. Trainings should be offered twice per year to ensure that all board members have the opportunity to take them given that there may be scheduling or time conflicts with other continuing education topics.

3. Adopt intermunicipal floodplain protection overlay district (POD) to require additional and intermunicipal review of site plans for building permits.

UBRI will draft model language for the floodplain POD using a floating floodplain district, and will research an accepted method of determination on which to base the floating district. The Work Group members will work with elected officials to ensure that the EPOD is adopted.

In addition to these three intermunicipal recommendations, each of the three communities identified additional priorities particular to its unique needs and circumstances.

Priorities for Greece:

- Strengthen Local Flood Damage Prevention Law by updating
- Convene agricultural interest to build relationships with and among farmers; Work with farmers and Soil and Water Conservation Districts to implement agricultural Best Management Practices to reduce on-farm flooding impacts and sediment and nutrient runoff
- Work with other municipalities to find and fund a mapping product that will meet each municipality's needs and identify floodplains on all streams for a range of recurrence intervals (e.g. 10, 25, 50, 100-year)
- Acquire floodplains that currently have natural land cover to maintain floodplain function and keep development out of harm's way
- Create drainage district or fee that would pay for stream maintenance program, and protection and restoration of wetlands and floodplains
- Determine flood messages and work with H₂O Hero program to incorporate them (turn around, don't drown; emergency plan at home; remove or secure yard items so they don't become stream debris)

Priorities for Parma:

- Strengthen existing Environmental Protection Overlay Districts by adopting geospatial datasets that are accepted as a standard (ex. New York State Department of Environmental Conservation Freshwater Wetlands).
- Assess current status of Community Rating System eligible activities and potential creditable actions, and take action to increase credit.
- Determine a Develop formal agreement to share services for membership and maintenance of the Community Rating System.
- Disconnect impervious runoff from drainage system to reduce contributions to stream flow

Priorities for Hilton:

- Work with New York State Department of Environmental Conservation to develop an approved stream maintenance plan
- Convene agricultural interest to build relationships with and among farmers; Work with farmers and Soil and Water Conservation Districts to implement agricultural Best Management Practices to reduce on-farm flooding impacts and sediment and nutrient runoff
- Use residential property owner survey results to formulate key messages for property owners, develop outreach materials and regularly send to property owners

To reduce this list to a set of recommendations that would be compelling and more easily communicated to policy makers, the Study Team re-structured the above lists into the following nine recommendations. Each of these final recommendations meets a need identified by the municipal representatives and will help the municipalities achieve their objectives as well as their larger goal of reducing flooding vulnerability.

1. Convene intermunicipal work group

Having a group that meets regularly that is responsible for implementing the Flood Smart Action Plan is essential to its success. This group will provide the additional and needed benefits of building and maintaining partnership and collaboration between Greece, Parma and Hilton and any other municipalities that would like to join, and providing a forum for communication and information sharing.

2. Develop training requirements or program for municipal boards

Municipal boards are the decision makers with the power to protect development from the impacts of flooding. Giving them the information to do that well is an essential component of effective floodplain planning and management particularly conveying the risk associated with decisions, the benefits that natural infrastructure provides, and how local governments can help their communities be more prepared.

3. Adopt intermunicipal floodplain protection overlay district (POD)

Home rule gives local governments the authority to regulate land use. A floodplain POD that requires additional and intermunicipal review of site plans for building permits will go a long way in managing

floodplains in a way that acknowledges the upstream-downstream connection of communities and keeps people away from flooding. Adopting a floodplain POD with a floating district has the additional benefit of regulating development in all floodplains, including those that haven't been mapped by FEMA.

4. Strengthen local flood damage prevention laws

Local flood damage prevention laws are required for any municipality that participates in the National Flood Insurance Program. By strengthening each municipalities' local law using the model language suggested in Appendix D, communities will commit to higher standards that will better protect people and assets. Going above and beyond the minimum standards can also secure more Community Rating System points which benefits community resilience as well as flood insurance policy holders.

5. Convene agricultural interests

Agricultural land occupies 40% of the total focal watersheds, and provides jobs for the area and supplies to the food production industry. It is important to build relationships with agricultural interests to protect this important component of the local economy and reduce flooding contributions from these lands.

6. Educate at-risk property owners

Residential properties comprise a very high percentage of the number of structures and the dollar value of properties within FEMA mapped floodplains. Conveying flooding risk for their property and educating on the National Flood Insurance Program, Biggert Waters, mitigation options and resources and FEMA mitigation programs will greatly help residents be more prepared so that they can respond to and recover from flooding more effectively.

7. Prioritize and protect natural infrastructure

Natural infrastructure, like wetlands and natural floodplains, helps reduce impacts of flood events by storing water and releasing it more slowly to the stream network and groundwater. Much of the remaining natural infrastructure in the three municipalities lies at the downstream-most end of the watersheds along the Lake Ontario coast. Floodplains and wetlands that lie upstream of population centers should be protected so they continue to provide flood attenuation services.

8. Share data with municipalities and the public

A lot of flooding information is collected by the municipalities and has been collected or generated by this project. Compiling this information and making it available to the public will enable multiple stakeholder groups to utilize that information in decision making. By having the same information, communication between municipalities, boards, and departments will be improved.

9. Utilize the Community Rating System

The National Flood Insurance Program's (NFIP) Community Rating System is a voluntary incentive program that recognizes communities for enforcing floodplain management activities that exceed the minimum NFIP requirements. There are many benefits to enhanced floodplain management such as improved public safety, property loss reduction, open space and natural resource protection, and better

post-disaster recovery. A discount of up to 45% off flood insurance premiums is also available to policyholders in participating communities.

At the end of this Approach description, a matrix (Table 2) has been created that lists the full set of recommendations that were reviewed and accepted by the municipal representatives and identifies the objectives addressed by each recommendation. Recommendations have been organized into one of the following categories:

- Collaboration and shared services
- Local law revisions and updates
- Local expertise
- On-the-ground projects and programs
- Information collection
- Information sharing
- Convening and working with stakeholders
- Education and outreach
- Funding opportunities
- Planning

We know this list is long but we want to point out that flood risk management should be wide ranging and shared by multiple stakeholders. Actions can be implemented by others in addition to the local governments. Additionally, not only are many of the products that have been generated for this project useful for fulfilling some of the objectives and recommendations, some of the recommendations are already either being implemented or pursued by the municipalities.

Step 6. Assess effectiveness

Assessing effectiveness is essential for measuring progress, learning from actions, and adapting future work. To assess effectiveness, the municipalities will measure 1) progress toward implementing recommendations, and 2) effectiveness of recommendations in reducing flooding vulnerability. The leadership of Greece, Parma and Hilton can use this information to refine their goals, strategies and actions.

The Study Team developed indicators of effectiveness for the nine prioritized recommendations based on importance, availability of data or ability to collect data, and to ensure measurement of a combination of short-term and long-term outcomes. The municipal representatives then refined the suggested indicators based on ...

In order to make the recommendations measureable, they have been made more specific as laid out below and by completion date in Table 1.

1. Convene intermunicipal work group that is responsible for progress towards implementation of Flood Smart Action Plan, and works to build and maintain intermunicipal partnership and collaboration.
 - Short-term measures: group has held its first meeting, and has completed the other priorities in this list by the due dates assigned.
 - Long-term measures: Work Group has continued to meet twice per year, has developed new priority recommendations for implementation, and has measured long-term outcomes of actions already completed.
2. Develop training requirement and/or program for municipal boards to ensure members are aware of the flood-related risks of land use decisions.
 - Short-term measures: Complete two trainings so that 50% of Board members are trained. Complete two additional trainings so that 100% of Board members are trained and 25% of Board have taken second training.
 - Long-term measures: Trainings on flood information have been integrated into Continuing Education Credit program and are offered twice per year.
3. Adopt intermunicipal floodplain protection overlay district (POD) that requires additional and intermunicipal review of site plans for building permits.
 - Short-term measures: Adopt floodplain POD.
 - Long-term measures: A method has been developed and implemented to track development, particularly where it was initially proposed and how local land use authority altered where it wound up, and where and/or how it was ultimately constructed.
4. Strengthen Local Flood Damage Prevention Law (LFDPL) with changes recommended in Appendix by Genesee/Finger Lakes Regional Planning Council (G/FLRPC).

- Short-term measures: Adopt LFDPL changes.
 - Long-term measures: Re-assess LFDPL language for areas to update and strengthen.
5. Convene agricultural interests to build relationships with farmers using conclusions in Appendix D as starting place.
- Short-term measures: Meeting held with Monroe County SWCD and one other agricultural stakeholder group, and role for municipalities determined.
 - Long-term measures: Municipalities will regularly convene or engage with farmers and agricultural stakeholder groups as measured by the number of meetings attended and the numbers of attendees. Best Management Practices on farmland will have been implemented with the SWCD as measured by the number of projects facilitated by municipal staff, and ideally by the reduction in surface water runoff from farmlands and sediment and nutrient delivery to streams.
6. Use residential property owner survey results to formulate key messages for at risk property owners, develop outreach materials and send annually to property owners.
- Short-term measures: One round of mailing, followed by annual mailings. Include self-addressed stamped postcard with a few survey questions devised to measure how perception of risk and understanding of NFIP change overtime.
 - Long-term measures: Change in perception of risk and understanding of NFIP has been tracked and annual mailings are modified based on effectiveness as measured by postcard survey.
7. Prioritize and protect existing natural infrastructure within the nine subwatersheds described in Appendix A.
- Short-term measures: Complete wetland and floodplain prioritization for protection by end of 2017 that includes assessment of flood attenuation, water quality and habitat benefits. Develop a mechanism for acquiring land outside of municipal jurisdictions, and work with upstream municipalities to build support for protection.
 - Long-term measures: Acquire 20 acres of priority wetlands and floodplains. Work to acquire an additional 20 acres per year. With a goal of protecting 90% of floodplains and 100% of DEC Freshwater Wetlands Class 1-3 within the jurisdictions of Greece, Parma and Hilton either through acquisition or adoption of floodplain POD, and a minimum of 50% of floodplains and 25% of wetlands in watershed areas outside these jurisdictions.
8. Share data with municipalities and the public via an online web mapper.
- Short-term measures: Online mapper is operational. By June of 2018 municipal staff and boards have been trained in use of the online mapper.
 - Long-term measures: Municipal staff and boards rely on online mapper for provision of data used in decision making. Both have been surveyed for their perceptions of

whether the availability of data has helped inform their decisions and improved consistent application of regulations.

9. Utilize the Community Rating System (CRS) to improve public safety, reduce property loss, protect open space and natural resources, and recover more effectively post-disaster.
 - Short-term measures: Parma has submitted an application to CRS, Greece has identified three new or improved creditable activities, and Hilton has evaluated the benefits of membership.
 - Long-term measures: Greece has moved up one CRS class and Parma has become a CRS class 8.

Finally, each municipality identified additional progress measures for recommendations unique to their municipality.

1. Greece will work with the Storm Water Coalition to determine flood messages and work with H₂O Hero program to incorporate them into outreach materials (ex. turn around, don't drown; emergency plan at home; remove or secure yard items so they don't become stream debris).
2. Greece will acquire and document flood easements to remove development rights from 100-year floodplains. They will have developed a system to store geospatial location data by end of 2018, and will have acquired 3 easements.
3. Greece will require developers to submit shapefiles of delineated floodplains and wetlands and will develop a system to store these data.
4. Parma will strengthen its existing Environmental Protection Overlay Districts. It will adopt New York State Department of Environmental Conservation Freshwater Wetland maps and/or National Wetland Inventory mapped wetlands and the National Hydrography Dataset of high resolution streams.
5. Parma will work with G/FLRPC to assess its activities that are eligible for Community Rating System (CRS) credit. It will develop a sustainable method to enroll and maintain its membership in the CRS program.
6. Hilton will develop a stream maintenance program that is approved by NYSDEC and will assess areas of collaboration with Parma. The stream maintenance plan will be completed and approved.
7. Hilton will allocate a portion of its soon-to-be created drainage district fee to the stream maintenance program, and protection and restoration of wetlands and floodplains (could be located outside of jurisdictional boundaries). XX amount of revenue will have gone to the stream maintenance program and to implement one wetland or floodplain restoration or protection project.

Table 1. Actions and measures of effectiveness for both progress towards implementing the recommendations and progress towards reducing vulnerability.

Suggested Completion	Type*	Actions and Measures of Effectiveness
Greece, Parma and Hilton Together		
End of 2016	R	Intermunicipal work group has had its first meeting.
June of 2017	R	Two trainings have been completed and 50% of board members have been trained.
	R	Parma has submitted an application to CRS, Greece has identified three new or improved creditable activities, and Hilton has evaluated the benefits of <u>membership</u> .
End of 2017	R	Local flood damage prevention laws have been strengthened by adopting standards above and beyond the minimum.
	R	Complete wetland and floodplain prioritization for protection by end of 2017 that includes assessment of flood attenuation, water quality and habitat benefits.
	R	Online mapper is operational.
June of 2018	R	Two additional trainings have been completed, 100% of board members have been trained and 25% of members have received second training.
	R	Municipal staff and boards have been trained in use of the online mapper.
End of 2018	R	The Floodplain Protection Overlay District has been adopted.
	R	Meeting held with Monroe County SWCD and one other agricultural stakeholder group, and role for municipalities determined.
	R	One round of mailing to residential property owners has been sent that included self-addressed stamped postcard with a few survey questions devised to measure how perception of risk and understanding of NFIP change overtime.
End of 2019	R	Develop a mechanism for acquiring land outside of municipal jurisdictions, and work with upstream municipalities to build support for protection.
2021	R	Work Group has met each year two times per year.
	R	Work group has developed new priority recommendations for implementation.
	R	Work group has measured long-term outcomes for actions already completed as listed in the "Completed By 2021" section in this table.
	V	Trainings on flooding have been integrated into Continuing Education Credit program and are offered twice per year.
	V	A method has been developed and implemented to track development, particularly where it was initially proposed and how local land use authority altered where it wound up, and where and/or how it was ultimately constructed.

Suggested Completion	Type*	Actions and Measures of Effectiveness
	R	Local flood damage prevention law language has been re-assessed for areas to update and strengthen.
	R	Municipalities regularly convene or engage with farmers and agricultural stakeholder groups as measured by the number of meetings attended and the numbers of attendees.
	V	Best Management Practices on farmland have been implemented with the SWCD as measured by the number of projects facilitated by municipal staff, and ideally by the reduction in surface water runoff from farmlands and sediment and nutrient delivery to streams.
	V	Change in perception of residential property owners has been tracked and annual mailings are modified based on effectiveness as measured by postcard survey.
	V	20 acres of priority wetlands and floodplains have been acquired, and work is occurring to acquire an additional 20 acres per year. With a goal of protecting 90% of floodplains and 100% of DEC Freshwater Wetlands Class 1-3 within the jurisdictions of Greece, Parma and Hilton either through acquisition or adoption of EPOD, and a minimum of 50% of floodplains and 25% of wetlands in watershed areas outside these jurisdictions.
	V	Municipal staff and boards rely on online mapper for provision of data used in decision making. Both have been surveyed for their perceptions of whether the availability of data has helped inform their decisions and improved consistent application of regulations
	V	Greece has moved up one CRS class and Parma has become a CRS class 8.
Greece		
End of 2019	R	Work with the Storm Water Coalition to determine flood messages and work with H ₂ O Hero program to incorporate them into outreach materials (ex. turn around, don't drown; emergency plan at home; remove or secure yard items so they don't become stream debris).
	V	Acquire and document flood easements to remove development rights from 100-year floodplains. Develop a system to store geospatial location data.
	R	Require developers to submit shapefiles of delineated floodplains and wetlands and develop a system to store these data.
Parma		
End of 2016	R	Work with G/FLRPC to assess activities that are eligible for Community Rating System credit.

Suggested Completion	Type*	Actions and Measures of Effectiveness
End of 2017	V	Strengthen existing Environmental Protection Overlay Districts by adopting New York State Department of Environmental Conservation Freshwater Wetland maps and/or National Wetland Inventory mapped wetlands, the National Hydrography Dataset of high resolution streams, and XX .
End of 2018	R	Develop a sustainable method to enroll and maintain membership in the CRS program.
Hilton		
End of 2017	R	Develop a stream maintenance program that is approved by NYSDEC and assess areas of collaboration with Parma.
	R	Allocate a portion of soon-to-be drainage district fee to the stream maintenance program, and protection and restoration of wetlands and floodplains (could be located outside of jurisdictional boundaries).
2021	V	XX amount of revenue will have gone to the stream maintenance program and to implement one wetland or floodplain restoration or protection project.
* R = effectiveness of implementing recommendations, V = effectiveness of reducing vulnerability		

Table 2. Full list of recommendations that were developed by the Study Team and approved by the municipal representatives. Rows highlighted in orange are the nine prioritized recommendations.

	A. Minimize Economic Impacts			B. Minimize damage to property owners							C. Maximize multiple benefits of flood attenuation solutions			D. Maximize long-term floodplain management			
	A.1. Minimize unscheduled interruptions of municipal staff time	A.2. Minimize cost and maintenance of flood attenuation solutions	A.3. Maximize shared services and inter-municipal collaboration	B.1. Increase authority for municipality to regulate all floodplains	B.2. Maximize appropriate siting of development	B.3. Improve flood-related development standards	B.4. Maximize stream and wetland buffers	B.5. Minimize wetland loss	B.6. Increase understanding of risk areas, their cause, and how to mitigate	B.7. Increase public awareness	C.1. Reduce sediment and nutrient delivery to streams	C.2. Reduce sediment delivery to Braddock Bay	C.3. Reduce the impact of debris in streams	D.1. Maximize support for Flood Smart Communities approach	D.2. Maximize sustainable funding stream to implement recommendations	D.3. Maximize use of long-term planning	D.4. Maximize measures of success
Recommendations																	
Collaboration and Shared Services																	
Formalize municipal collaboration in use of code enforcement officers and other technical staff during natural disaster response and recovery to increase efficiency			X														
Parma and Hilton work together to identify and implement a solution for Tallwood Ditch to reduce road flooding			X														
Develop formal agreement to share services for membership and			X														

	A. Minimize Economic Impacts			B. Minimize damage to property owners						C. Maximize multiple benefits of flood attenuation solutions			D. Maximize long-term floodplain management			
maintenance of the Community Rating System																
Identify priority shared projects and work together to implement those projects			X													
Develop collaborative emergency response plan			X													
Convene intermunicipal work group that is responsible for progress towards implementation of Flood Smart Action Plan, and works to build and maintain intermunicipal partnership and collaboration.			X													
Include funds in municipal budgets to implement mutually beneficial projects			X													
Build relationships with the community and between municipalities at watershed scale		X	X						X				X			
Make full use of existing storm warning system through Monroe County			X													

	A. Minimize Economic Impacts			B. Minimize damage to property owners						C. Maximize multiple benefits of flood attenuation solutions			D. Maximize long-term floodplain management			
Local Law Revisions and Updates																
Limit impervious surfaces in new and re-development on sites more than 1 acre to ___% to maximize infiltration and reduce runoff		X								X	X					
Adopt intermunicipal floodplain protection overlay district (POD) that requires additional and intermunicipal review of site plans for building permits		X	X	X	X		X									
Adopt setback ordinance to allow space for natural floodplains and to maintain existing riparian buffers		X			X		X			X	X					
Work with DEC to develop an approved stream maintenance plan			X							X	X	X				
Strengthen Local Flood Damage Prevention Law (LFDPL) with changes recommended in Appendix by G/FLRPC			X	X		X										
Adopt wetland protection EPOD, wetland protection ordinance or no net loss								X		X	X					
Strengthen enforceability of Parma's EPODs by					X			X		X	X					

	A. Minimize Economic Impacts			B. Minimize damage to property owners					C. Maximize multiple benefits of flood attenuation solutions			D. Maximize long-term floodplain management			
making digital data sources available; Adopt NWI and DEC wetland layers															
Require in-basin mitigation of non-jurisdictional wetland impact					X			X		X	X				
Require detailed studies by development				X	X				X						
Eliminate walk out basements adjacent to streams and wetlands	X				X	X									
Strengthen local stormwater laws. Ex. Preferred alternative - require green infrastructure planning that reduces impervious surface and maximize the natural infiltration on site, 2nd alternative - use of constructed stormwater green infrastructure, Last alternative - fully structural stormwater control measures						X									
Adopt recommendations of Stormwater Coalition's Green Infrastructure Code Project.						X									
Reduce the disturbance area for new development to a smaller threshold						X									

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to trigger stormwater management practices (<5 acres for single homes, <1 acre for other development) - local law revision/update														
Local Expertise														
Attend Code Enforcement Officer training workshops about natural disaster response and recovery			X											
Develop training requirement and/or program for municipal boards to ensure members are aware of the flood-related risks of land use decisions				X										
Train highway departments and road crews in Emergency Stream Intervention techniques								X						
Build more staff capacity	X													
<u>On-the-Ground Projects and Programs</u>														
Disconnect impervious runoff from drainage system to reduce contributions to stream flow		X						X						
Prioritize and protect existing natural		X		X		X	X	X	X					

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infrastructure within the nine subwatersheds described in Appendix A																
Acquire and document flood easements to remove development rights from 100yr floodplains		X			X		X									
Work with Trees for Tribes, stormwater coalition, SWCD and others to implement buffer restoration in prioritized areas							X			X	X					
Work with Gates to construct retention basin to reduce stormwater flows and sediment and nutrient inputs										X						
Parma and Hilton work together to identify and implement a solution for Tallwood Ditch to reduce sediment and nutrient inputs										X						
Modify road side ditch management practices to reduce sediment and nutrient inputs										X						
Information Collection																
ID areas of frequent risk and unusual hazard including upstream areas of the watershed to					X											

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target existing development for mitigation and property owners for education and outreach																
Work with Monroe County to install stream gages on priority streams to provide quality and consistent longterm dataset						X	X		X							
Create specific design templates to facilitate implementation (NYC has done this with bioswales)						X										
Delineate all existing wetlands; develop method to capture wetland studies geospatially (have firm submit shape file?)								X								
Identify sources of sediment and nutrient inputs to prioritize possible project areas										X	X					
Demonstrate cost of mismanagement									X				X	X		
Information Sharing																
Work together to find and fund a mapping product that will meet each municipality's needs and identify floodplains on all			X	X					X							

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streams for a range of recurrence intervals (e.g. 10, 25, 50, 100)																
Share data with municipalities and the public via an online web mapper to minimize redundant efforts and be sure everyone is making decisions with the same info			X	X				X	X	X						
Incorporate information from vulnerable areas assessment into emergency action plans																
Formalize non-FEMA floodplains (municipality submits developer floodplain studies to FEMA for incorporation into maps)				X												
Convening and Working with Stakeholders																
Convene agricultural interests to build relationships with farmers using conclusions		X		X						X	X					
Work with farmers and SWCD to implement ag BMPS to reduce on-farm flooding impacts and sediment and nutrient runoff		X					X	X		X	X					

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Work with human health, social justice or disadvantaged community organizations to develop effective emergency planning and response outreach											X			
Provide advisory service on flood insurance, property protection/mitigation, and financial assistance								X						
Convene property owners of flood prone neighborhoods to educate them on NFIP and FEMA programs and identify solutions (increase public understanding of the value of mitigation measures, predict mitigation costs to determine how much funding would be needed for mitigation)								X						
Education and Outreach														
Develop and implement outreach and education program for property owners targeting flood insurance availability and repetitive loss properties														

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Educate property owners about how they can reduce debris in streams and the impacts of debris in streams											X					
Determine flood messages and work with H2O Hero program to incorporate them (turn around, don't drown; emergency plan at home; remove or secure yard items so they don't become stream debris)									X							
Use residential property owner survey results to formulate key messages for at risk property owners, develop outreach materials and send annually to property owners										X						
Funding Opportunities																
Create contingency fund to pay for staff overtime	X															
Creation of drainage district or fee that would pay for stream maintenance program, and protection and restoration of wetlands and floodplains						X								X		

	A. Minimize Economic Impacts			B. Minimize damage to property owners						C. Maximize multiple benefits of flood attenuation solutions			D. Maximize long-term floodplain management			
Scale drainage district fee (or stormwater management fee) proportionally to impervious cover of parcel		X				X								X		
Incorporate floodproofing structures into the “eligible repairs” for one-time grants and low interest loans (i.e. Monroe County Home Improvement Program)														X		
Work with Monroe County or stormwater coalition to develop grant program for prioritized vulnerable areas to implement stormwater management BMPs														X		
Planning																
Utilize the Community Rating System (CRS) to improve public safety, reduce property loss, protect open space and natural resources, and recover more effectively post-disaster						X						X		X		
Assess current status of CRS eligible activities and potential creditable																

	A. Minimize Economic Impacts			B. Minimize damage to property owners			C. Maximize multiple benefits of flood attenuation solutions			D. Maximize long-term floodplain management		
actions, and take action to increase credit												
Incorporate recommendations into Monroe County All Hazard Mitigation Plan										X	X	
Continue to enforce MS4 requirements (we should expand on this)							X					
Update Floodplain Action Plan every 5 years										X	X	X
Demonstrate benefits and effectiveness of this type of approach by adopting intermunicipal floodplain EPOD and measuring improvements										X		X