

# Green Infrastructure and Hazard Mitigation *Workshops to Address Water Quality and Water Quantity*

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FEMA



Virginia Department of Conservation & Recreation

# Co-Benefits of Green Infrastructure

**Air Quality**

**Communities**

**Habitat and  
Wildlife**

**Climate Resiliency**

**Water Quality and  
Quantity**



# Project Background

- Phase I: series of modules describing water quality/hazard mitigation plan integration
  - Lisa Hair (OW/OWOW) and Tetra Tech; University of Maryland, EFC
- Phase II: training materials to present modules in workshops
  - EPA Region 3/PG Environmental with federal and state partners
- Currently finalizing training materials wth plans to post them on the EPA website



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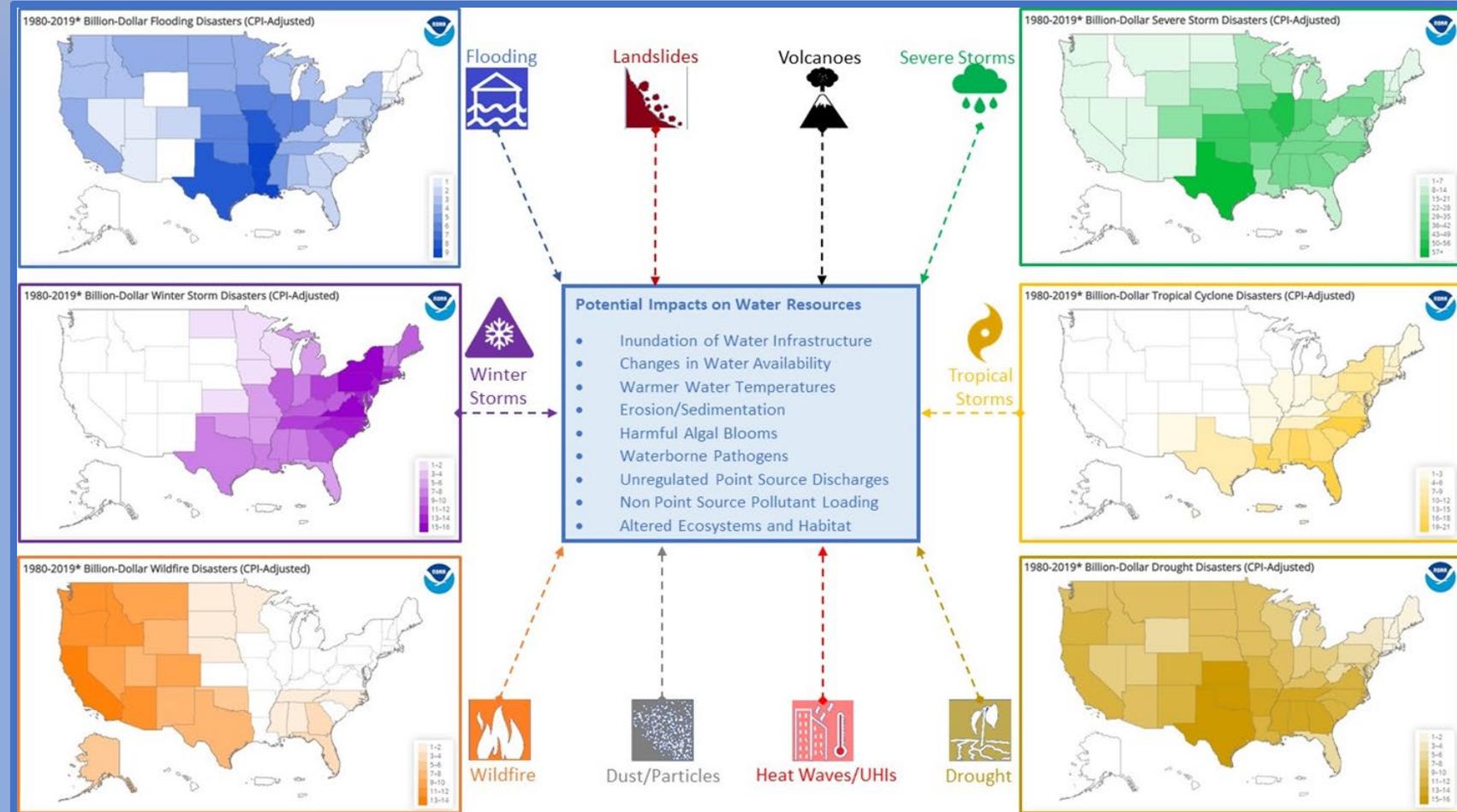


# Module 1

## Introduction to GI/LID and Hazard Mitigation

### Module Steps:

1. Learn about the purpose of the series and the modules included.
2. Review natural hazards affecting water resources.
3. Learn about nature-based solutions and their role in Federal (EPA and FEMA), state, local, tribal, and territory (SLTT) programs.
4. Learn about the benefits of incorporating nature-based solutions into hazard mitigation planning.
5. Assess goals, vulnerabilities, strategies, and actions to mitigate natural hazards.

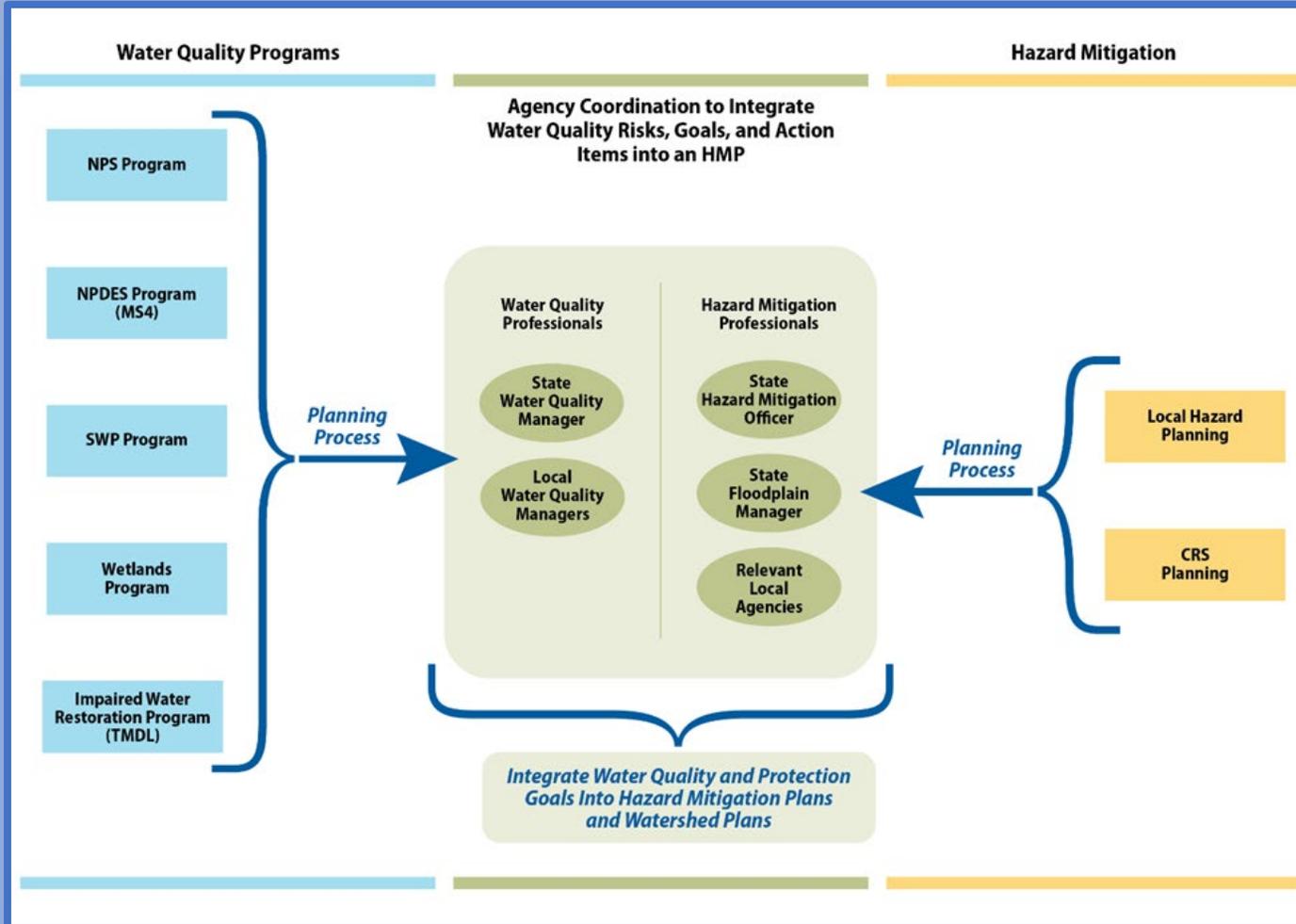


# Module 2

## How Water Quality Protection Programs Fit Within and Enhance Hazard Mitigation Strategies

### Module Steps:

1. Review key concepts of water quality, source water protection and hazard mitigation planning.
2. Assess how water quality planning processes can align with hazard mitigation plans.
3. Consider your approach to including water quality risks, goals, strategies, and action items in your state or local HMP. Understand who should be involved in a coordinated planning approach.
4. Become familiar with elements of key water quality and source water protection related programs.
5. Understand how integrating planning processes can leverage additional funding and increase the efficiency and effectiveness of plan integration.
6. Review local and state examples to translate what you learned into integrated HMPs.



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Recommended CRS Steps to Meet Local Mitigation Plan Requirements		Step 1. Determine the Planning Area and Resources	Step 2. Involve the Public	Step 3. Coordinate	Step 4. Assess the Hazard	Step 5. Assess the Problem	Step 6. Set Goals	Step 7. Review Possible Activities	Step 8. Draft an Action Plan	Step 9. Adopt the Plan	Step 10. Implement, Evaluate, Revise
Recommended Local Hazard Mitigation Planning Steps		Step 1. Determine the Planning Area and Resources	Step 2. Involve the Public	Step 3. Coordinate	Step 4. Assess the Hazard	Step 5. Assess the Problem	Step 6. Set Goals	Step 7. Review Possible Activities	Step 8. Draft an Action Plan	Step 9. Adopt the Plan	Step 10. Implement, Evaluate, Revise
<b>1. BUILD PARTNERSHIPS</b>											
Identify key stakeholders		●	■	●	■	●	■	●	■	●	■
Identify issues of concern to include in the watershed plan		●	■	●	■	●	■	●	■	●	■
Set preliminary goals		●	■	●	■	●	■	●	■	●	■
Conduct public outreach		●	■	●	■	●	■	●	■	●	■
<b>2. CHARACTERIZE THE WATERSHED</b>											
Collect existing data and create a watershed inventory		●	■	●	■	●	■	●	■	●	■
Analyze data		●	■	●	■	●	■	●	■	●	■
Identify causes and sources of pollution that need to be controlled*		●	■	●	■	●	■	●	■	●	■
Identify data gaps and collect additional data if needed		●	■	●	■	●	■	●	■	●	■
Quantify pollutant loads		●	■	●	■	●	■	●	■	●	■
<b>3. FINALIZE GOALS AND IDENTIFY SOLUTIONS</b>											
Set overall goals and management objectives		●	■	●	■	●	■	●	■	●	■
Develop indicators/targets		●	■	●	■	●	■	●	■	●	■
Determine load reductions needed*		●	■	●	■	●	■	●	■	●	■
Identify critical areas		●	■	●	■	●	■	●	■	●	■
Develop management measures to achieve goals*		●	■	●	■	●	■	●	■	●	■
<b>4. DESIGN AN IMPLEMENTATION PROGRAM</b>											
Develop implementation schedule*		●	■	●	■	●	■	●	■	●	■
Develop interim milestones to track implementation of management measures*		●	■	●	■	●	■	●	■	●	■
Develop criteria to measure progress towards meeting watershed goals*		●	■	●	■	●	■	●	■	●	■
Develop monitoring component*		●	■	●	■	●	■	●	■	●	■
Develop information/education component*		●	■	●	■	●	■	●	■	●	■
Develop evaluation process		●	■	●	■	●	■	●	■	●	■
Identify technical and financial assistance needed to implement plan*		●	■	●	■	●	■	●	■	●	■
Assign responsibility for revising the plan		●	■	●	■	●	■	●	■	●	■
<b>5. IMPLEMENT WATERSHED PLAN</b>											
Implement management strategies		●	■	●	■	●	■	●	■	●	■
Conduct monitoring		●	■	●	■	●	■	●	■	●	■
Conduct information/education activities		●	■	●	■	●	■	●	■	●	■
<b>6. MEASURE PROGRESS AND MAKE ADJUSTMENTS</b>											
Review, evaluate information		●	■	●	■	●	■	●	■	●	■
Prepare annual workplans		●	■	●	■	●	■	●	■	●	■
Report back to stakeholders and others		●	■	●	■	●	■	●	■	●	■
Make adjustments to program		●	■	●	■	●	■	●	■	●	■

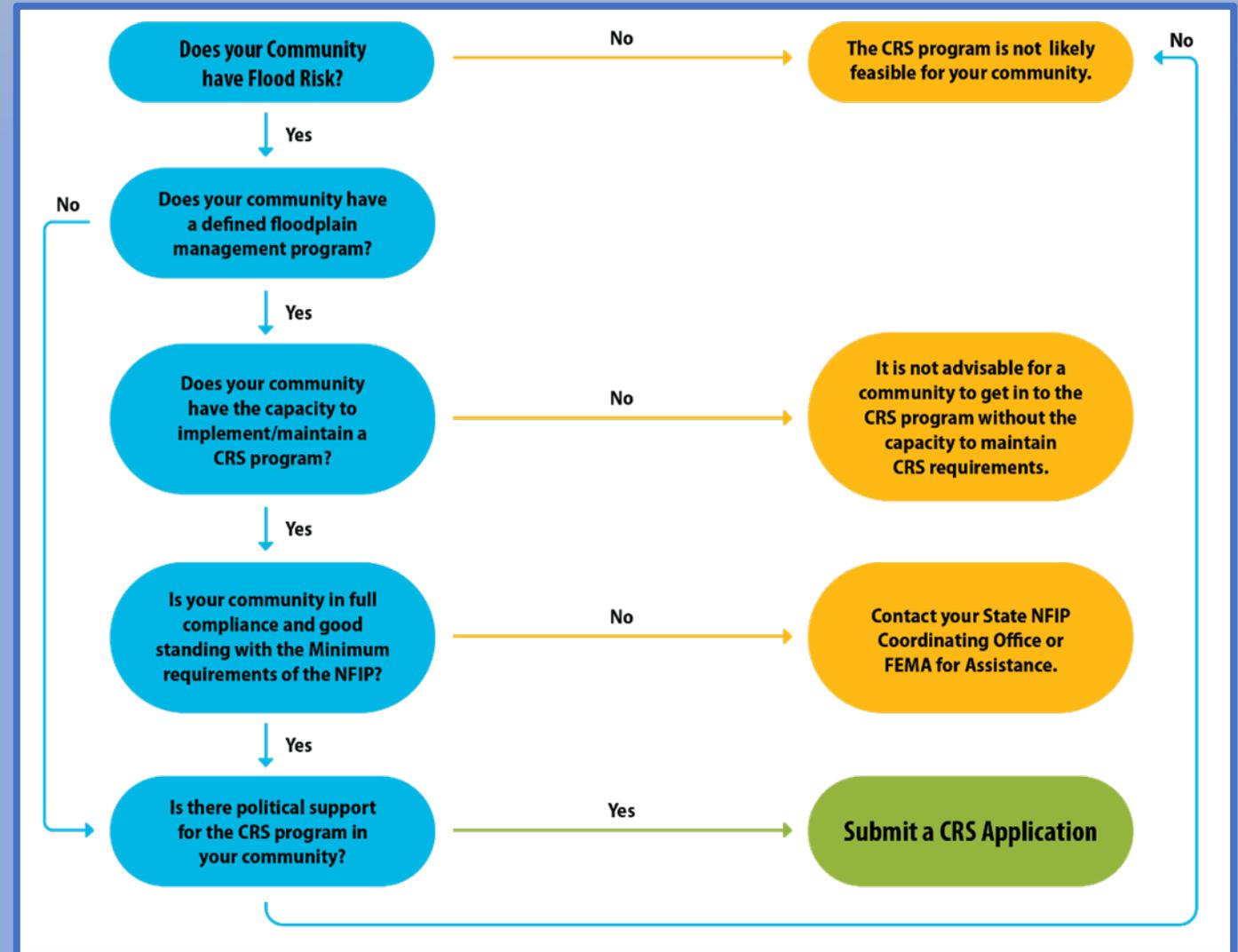
\*Nine minimum elements EPA believes are the most critical to preparing effective watershed plans and are generally required for watershed projects funded under section 319. Three of the nine elements are considered during the characterization and goal-setting phases to address the primary sources of pollution in the watershed and to determine the management strategies needed in specific areas to reduce the pollution to meet water quality goals. The other six elements are used to develop a specific plan of action with measurable targets and milestones, and the necessary financial and technical resources needed to restore the waterbody.

# Module 3

## How to Build Support for Local Water Resource Management Through the FEMA National Flood Insurance Program's Community Rating System

### Module Steps:

1. Understand the NFIP and its environmentally-related CRS activities.
2. Learn how to determine if CRS participation is relevant for your community.
3. Understand how to obtain multiple benefits—CRS activities can support, strengthen, or incentivize the implementation of water quality planning; and can help obtain more flood insurance discounts.
4. Learn how to integrate CRS activities, water quality planning, and hazard mitigation planning to strengthen the success of both program types and ensure the most benefits for your community.



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Series	Category	Activity	
<b>300 Series Overview:</b> This series credits programs that advise people about the flood hazard, encourage the purchase of flood insurance, and provide information about ways to reduce flood damage. These activities also generate data needed by insurance agents for accurate flood insurance rating. They generally serve all members of the community.			
300	Public Information Activities	310	Elevation Certificates
		320	Map Information Service
		330	Outreach Projects
		340	Hazard Disclosure
		350	Flood Protection Information
		360	Flood Protection Assistance
		370	Flood Insurance Promotion
<b>400 Series Overview:</b> This series credits programs that provide increased protection to new development. These activities include mapping areas not shown on the Flood Insurance Rate Map (FIRM), preserving open space, protecting natural floodplain functions, enforcing higher regulatory standards, and managing stormwater. The credit is adjusted to recognize impacts for growing communities.			
400	Mapping and Regulations	410	Flood Hazard Mapping
		420	Open Space Preservation
		430	Higher Regulatory Standards
		440	Flood Data Maintenance
		450	Stormwater Management
<b>500 Series Overview:</b> This series credits programs for areas in which existing development is at risk. Credit is provided for a comprehensive floodplain management plan, relocating or retrofitting flood-prone structures, and maintaining drainage systems.			
500	Flood Damage Reduction Activities	510	Floodplain Management Planning
		520	Acquisition and Relocation
		530	Flood Protection
		540	Drainage System Maintenance
<b>600 Series Overview:</b> This series provides credit for measures that protect life and property during a flood, through flood warning and response programs. There is credit for the maintenance of levees and for state regulatory programs for dams, as well as for programs that prepare for the potential failure of levees and dams.			
600	Warning and Response	610	Flood Warning and Response
		620	Levees
		630	Dams

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Activity	Description <sup>1</sup>	Water Quality Planning Programs in Which CRS Activities Might Overlap <sup>2</sup>
<b>300 Public Information Activities</b>		
320	Map Information Service The OBJECTIVE of this activity is to provide inquirers with information about the local flood hazard and about flood-prone areas that need special protection because of their natural functions.	<ul style="list-style-type: none"> <li>Stormwater Management</li> <li>Watershed Management (Includes Wetlands Protection)</li> </ul>
330	Outreach Projects The OBJECTIVE of this activity is to provide the public with information needed to increase flood hazard awareness and to motivate actions to reduce flood damage, encourage flood insurance coverage, and protect the natural functions of floodplains.	<ul style="list-style-type: none"> <li>Source Water Protection</li> <li>Stormwater Management</li> <li>Watershed Management</li> </ul>
350	Flood Protection Information The OBJECTIVE of this activity is to provide the public with information about flood protection that is more detailed than that provided through outreach projects.	<ul style="list-style-type: none"> <li>Source Water Protection</li> <li>Stormwater Management</li> <li>Watershed Management</li> </ul>

# Module 4

## How to Incorporate Funding and Financial Strategies into Integrated Plans

### Module Steps:

1. Examine the financial benefits of integrated hazard mitigation and water resource planning.
2. Review basic best practices for incorporating funding and finance into integrated planning.
3. Consider appropriate funding and financing options for implementing integrated hazard mitigation and water resource projects.
4. Become familiar with the benefits, challenges, and ideal uses related to specific funding and financing strategies.
5. Explore community examples on how taking a blended finance approach can leverage public, private and philanthropic dollars to increase the amount of capital directed at hazard mitigation and water resource implementation.

**Funding:** Providing “one way” financial resources to support a need, program or project (i.e. taxes, fees and grants).

**Financing:** The “two-way” acquisition of money for a program or project (i.e. loans and bonds).

Financing Mechanisms	
Cost Reducers	Revenue Streams
Comprehensive Planning	Taxes
Capital Improvement Programs	Fees
Cooperative Procurement and Inter-local Resource Sharing	Bonds and Loans
Public Private Partnerships	Grants
Incentives - Rebates and Tax Credits	Crowdfunding
Regulations and Policy	Offsite Crediting Programs

**Blended Finance:** refers to the idea of combining multiple finance and funding sources. Having a diverse funding portfolio can help ensure the implementation of projects.

# Module 5

## Overview of EPA/FEMA Pilot Projects and Lessons Learned

### Module Steps:

1. Review and understand the best practices developed from lessons learned during the four pilot projects.
2. Incorporate best practices learned from the pilot projects into your planning process.



### Lessons Learned

- Conduct a Stakeholder-based Assessment to Define Issues and Affected Stakeholders
- Use a Third Party to Facilitate the Effort
- Identify a Champion
- Form a Core Group of Invested People
- Understand How the Planning Process Works in the Community
- Understand the Funding and Project Management Requirements to Ensure Continuity
- Keep the Focus on Plan Integration and Alignment

# Module 6

## Three Examples of Hazard Mitigation Plans That Include GI/LID Practices and Water Quality Integration

In 2019 the City of Milwaukee wrote their Hazard Mitigation Plan to include mitigation strategies that reduce hazards associated with flooding and stormwater drainage issues and incorporate Green Infrastructure as a means to achieve those goals.

### Existing GI Provisions from City Stormwater Management Ordinances

- Reduce adverse impacts from stormwater runoff
- Attain and maintain water quality standards
- Reduce the effects of development on erosion
- Minimize damage to public and private property
- Minimize impervious cover to reduce nonpoint source pollution
- Promote the co-benefits of GI/LID
- Provide adaptation and resilience to climate change



### Stakeholders

- All Hazards Mitigation Plan
- Local Planning Team
- Southeastern Wisconsin Regional Planning Commission (SEWRPC)
- Milwaukee Metropolitan Sewerage District (MMSD)
- University of Wisconsin-Madison's Nelson Institute for Environmental Studies

# Workshop Goals

- Develop training materials to present the content of the modules
- Target Audience: floodplain managers, state hazard mitigation officers, local officials, water quality planners, etc.
- Present as a new concept
- Partners: federal and state
- Community of Practice
- Interactive sessions
- Come away with an idea of how to get started in their community



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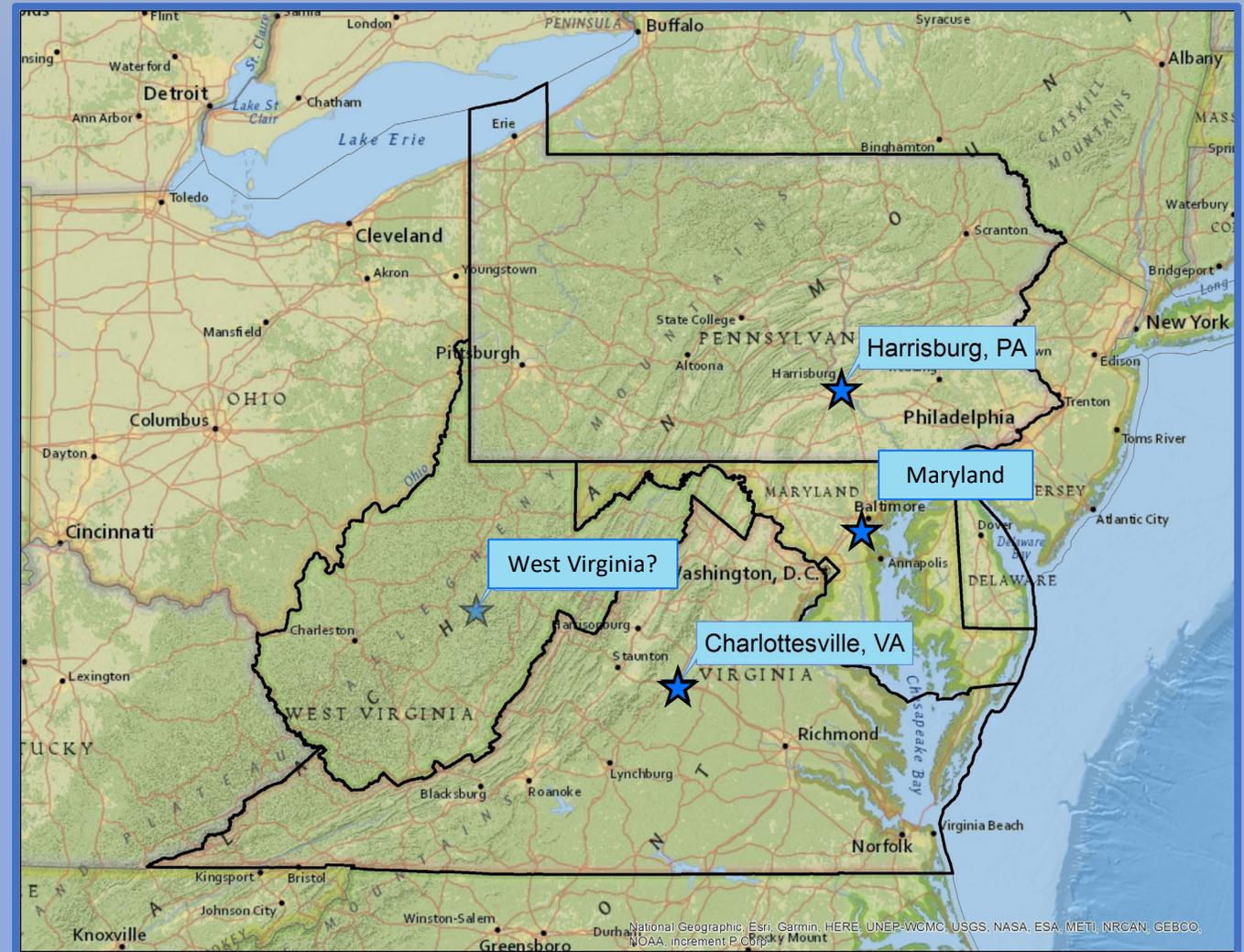
# Workshop Agenda (Harrisburg, PA)

Topics	Time	Presenters
Introduction	9:00 AM – 9:15 AM	EPA Region 3
Session 1A: Overview	9:15 AM – 10:15 AM	PEMA; Virginia Department of Conservation and Recreation
<b>Session 1B: Mini Exercise and Q&amp;A</b>	<b>10:15 AM – 10:45 AM</b>	<b>PG Environmental</b>
Morning Break	10:45 AM – 11:00 AM	
Session 2A: Plan Integration	11:00 AM – 12:00 PM	FEMA; PEMA
Lunch	12:00 PM – 1:00 PM	
<b>Session 2B: Mini Exercise and Q&amp;A</b>	<b>1:00 PM – 1:30 PM</b>	<b>PG Environmental</b>
Session 3: Resources and Tool Demonstration	1:30 PM – 2:00 PM	PEMA; EPA Region 3
Session 4: Funding and Grant Panel Discussion	2:00 PM – 2:45 PM	EPA Region 3; University of Maryland EFC; USACE Silver Jackets; PEMA
<b>Session 5: Facilitated Exercise Discussion</b>	<b>2:45 PM – 3:45 PM</b>	<b>All Participants</b>
Recap and Closing	3:45 PM – 4:00 PM	EPA Region 3

# Pilot Workshop Locations

Pilots to test training materials:

- Harrisburg, PA
  - July 16<sup>th</sup>
- Charlottesville, VA
  - August 20<sup>th</sup>
- Western Maryland
  - October 27<sup>th</sup>



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## Questions?

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