

Enhancing Natural Hazard Resilience through Nonpoint Source Management

*Ellie Flaherty, Nonpoint Source Management
Branch, EPA Office of Water*

What We'll Cover

- Benefits of integrating water quality and hazard mitigation planning
- Connection between nature-based solutions and hazard mitigation
- Brief overview of FEMA policy approach, Hazard Mitigation Plans, and HMA grants
- Case study example: Meramec River Watershed pilot



Benefits of Collaborating Across Hazard Mitigation and Water Quality Programs



Integrated planning processes – water quality and hazard mitigation – more efficient



Leveraging of hazard mitigation and water quality funds



Water quality programs offer access to technical expertise on nature-based solutions to hazards



Adopted broadly, water quality practices can help reduce risk from hazards

Nature-Based Solutions and Hazard Mitigation

Nature-based solutions (NBS) focus on increasing the resilience of water resource quantity and quality, and may include:

- Preserving and restoring uplands, streams, and floodplains
- Swales, enhanced-soil infiltration basins, and trees (flood)
- Restoring native vegetation (drought, wildfire, erosion)
- Trees and green roofs (urban heat island)
- Agricultural land use practices that enhance soil health (flood/runoff volume and improve resilience to drought)

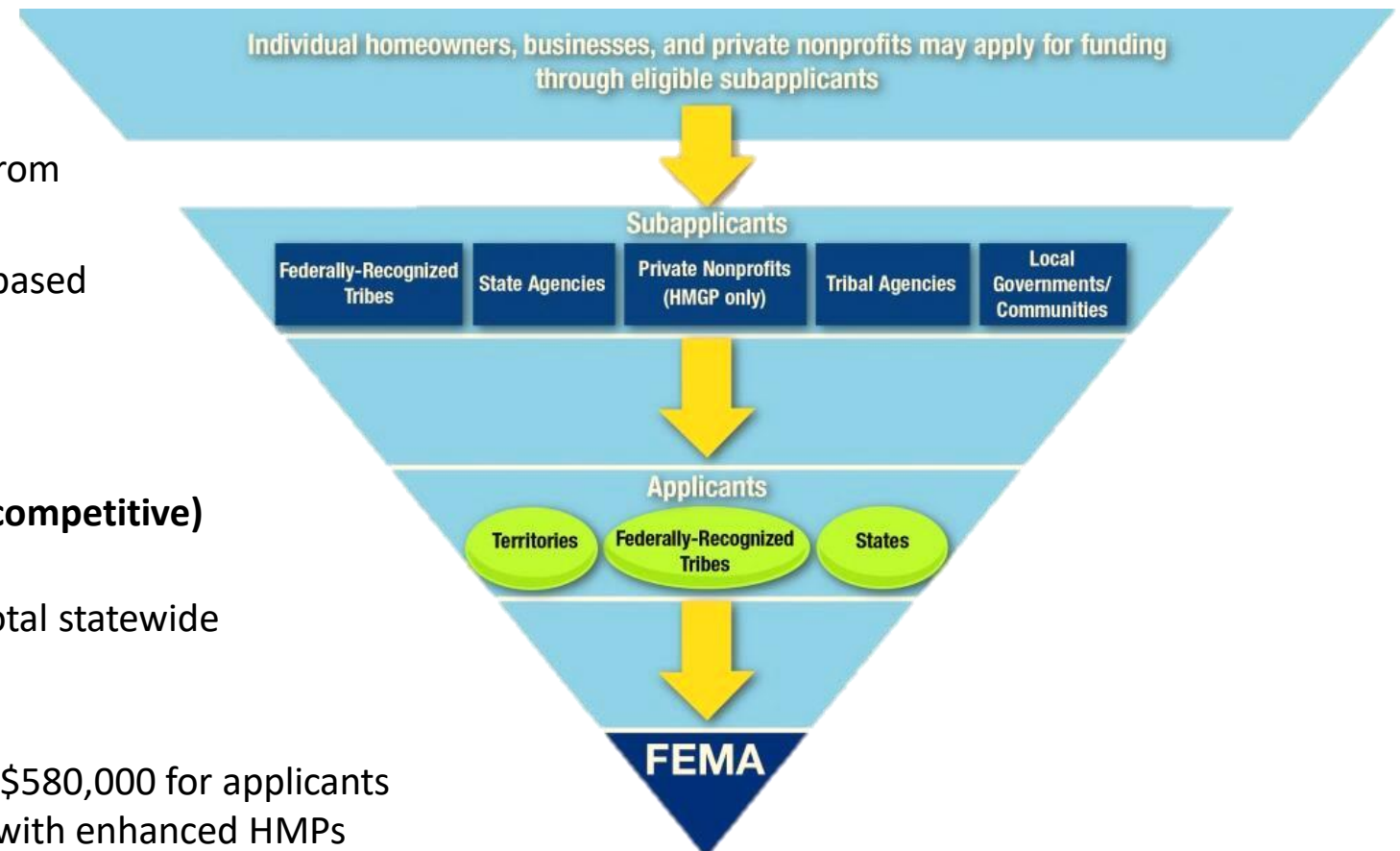
FEMA Hazard Mitigation Approach and Policy Background

- Historically focused on response and recovery, but since the early 1990s has become increasingly focused on pre-disaster mitigation and resilience.
- FEMA's efforts include building resilience into urban and rural infrastructure and mitigation solutions that promote sustainable water supplies and functioning ecosystems.
- FEMA funds several grant programs to support pre-disaster mitigation efforts as well as post-disaster recovery.

Hazard Mitigation Assistance (HMA)

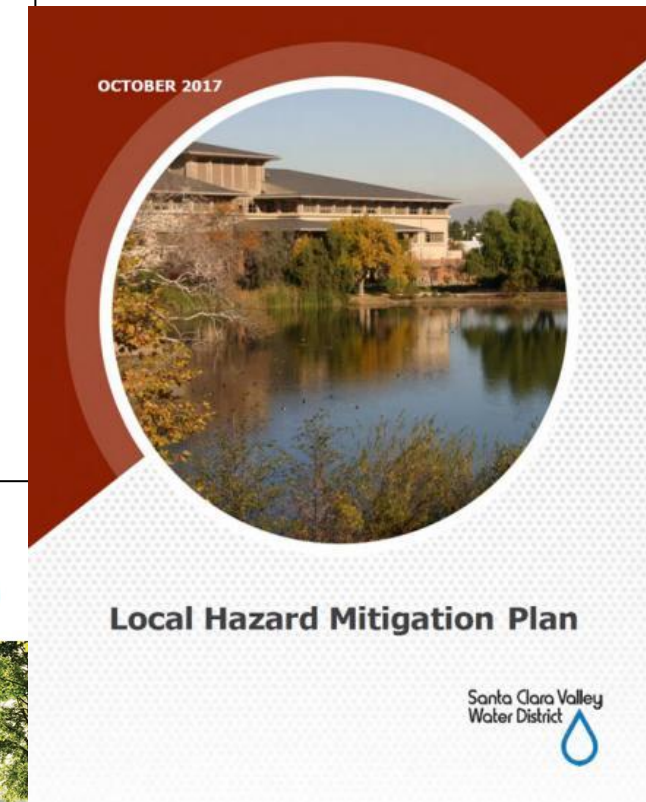
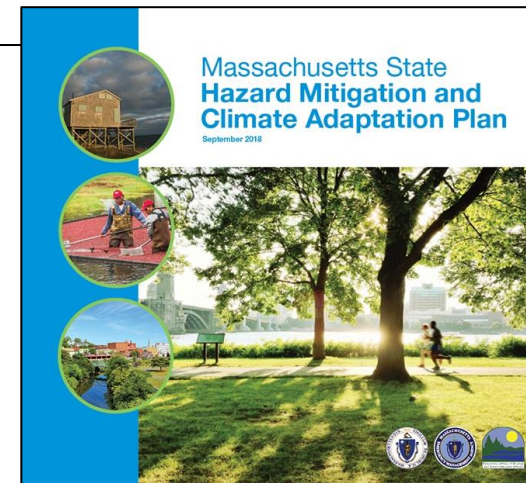
Four FEMA Hazard Mitigation Assistance (HMA) Funding Programs

- **Building Resilient Infrastructure and Communities (BRIC) (competitive):**
 - Pre-disaster mitigation grant - 6% set aside from disaster funds ~\$1 billion in FY21
 - Support for integrated planning and nature-based solutions
- **Flood Mitigation Assistance (FMA) (competitive)**
 - For planning and projects ~ \$160M
- **Hazard Mitigation Grant Program (HMGP) (non-competitive) Post disaster**
 - After Presidential Declaration ~15 – 20% of total statewide FEMA-funded recovery costs
- **HMGP Post Fire**
 - Post-fire recovery after disaster declaration ~\$580,000 for applicants with standard HMPs and ~770,000 for those with enhanced HMPs



FEMA Hazard Mitigation Plans: Overview

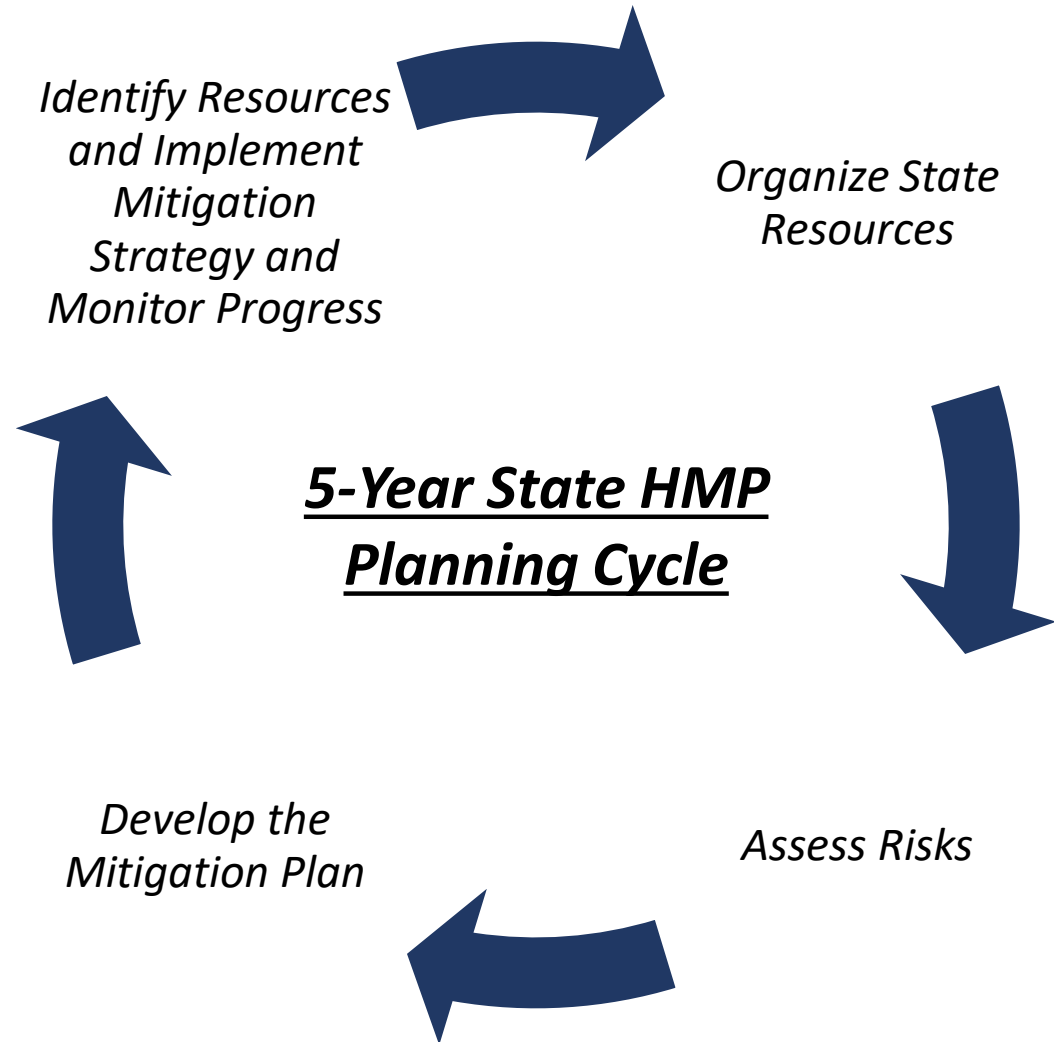
- The Stafford Act (1988) directs that each state have a HMP to be eligible for certain types of FEMA funding, including HMA funds.
- These plans focus on pre-disaster planning and address all natural hazards that can impact states and communities.
- Jurisdictions and Tribal governments may also maintain local HMPs.
- FEMA grant applicants must have a FEMA-approved HMP and projects must be consistent with the plan to receive funding.



HMP Elements and Planning Process

All HMPs include:

- Goal setting and 5-year planning process
- Natural hazard identification and risk assessment
- Mitigation Strategy to address identified risks
- Consideration of current and potential resources and capabilities to address natural hazards
- Identification of action items



FEMA Benefit-Cost Analysis Requirement



- FEMA grant applications require a Benefit-Cost Analysis (BCA). A project is considered cost-effective when the benefit/cost ratio is 1.0 or greater.
- FEMA's 2013 Mitigation Policy includes a cost-benefit analysis consideration of environmental improvements in combination with avoiding losses to properties and critical facilities/infrastructure.
- Nature-based solutions may be eligible for funding intended for environmental protection as well as hazard mitigation.

Putting Ideas Into Practice: GI and Natural Hazard Mitigation Pilot Projects

- Funded through the EPA Nonpoint Source Management Branch 2017-2019
- Goal: Build regional EPA/FEMA relationships and explore how green infrastructure (GI)/low impact development (LID) practices may be integrated with FEMA hazard mitigation planning to achieve hazard resilience and water quality co-benefits
- Pilots conducted in 9 EPA regions across the country



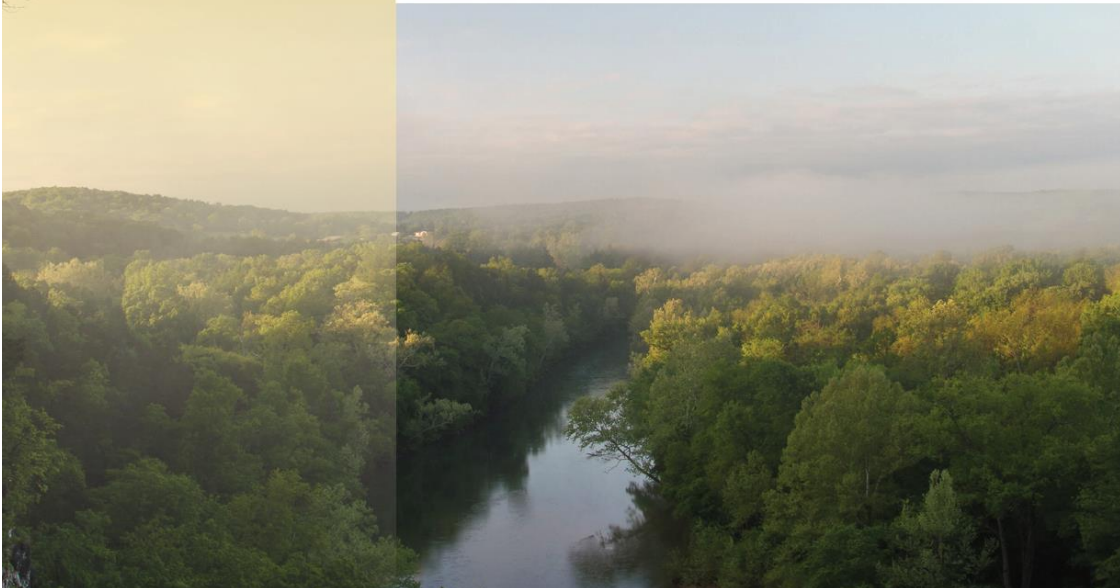
WICHITA STATE
UNIVERSITY

HUGO WALL SCHOOL
OF PUBLIC AFFAIRS
Environmental Finance Center

Report Written By Wichita State University Environmental Finance Center

Healthy Watershed Options for Floodplain Management

LOWER MERAMEC WATERSHED



Region 7: Meramec River Watershed, MO

- United States Army Corps of Engineers (USACE) Silver Jackets initiated a Floodplain Management Plan for the flood-prone Meramec River watershed.
- EPA Region 7 partnered with the Wichita State University (WSU) Environmental Finance Center (EFC) to produce the [*Healthy Watershed Options for the Meramec River*](#) report.
- The [Online funding search tool](#) was developed to support community partners in identifying potential funding opportunities for nature-based projects.

Cost Benefit Analysis Focus Areas

- Flood Prone Property Acquisition
- Floodplain Restoration
- Green Open Space Preservation



Lower Meramec Watershed Communities

City of Arnold
City of Eureka
City of Fenton
City of Pacific
City of Sunset Hills
City of Union
City of Valley Park
City of Wildwood
Franklin County
Jefferson County
St. Louis County

Meramec River, Photo by East-West Gateway.

CBA Conclusions

- Over a 20-year period, the benefits of floodplain restoration and/or preservation of open green space are greater than the costs.
- Investment in flood-prone property acquisition paired with floodplain restoration OR acquisition paired with parks, open space and trails is cost effective and provides long-term environmental, financial, safety and quality of life benefits to the community.
- First step: Acquire the flood-prone properties in the 1% AEP.
- Pair flood-prone property acquisitions with floodplain restoration or enhancement (parks, open space, trails, etc.)

Missouri Watershed Funding Search Tool

MISSOURI WATERSHED FUNDING DATABASE

Match your project with the right funding stream.

Looking for help funding your healthy watershed project? We've curated all the funding opportunities in one place, and organized them by tags in our searchable database.

 [Search Funding Opportunities >>](#)

 [Excel Download of Funding Options Quicklist >>](#)

 [Cost-Benefit Analysis Report >>](#)

 [Lower Meramec Healthy Watershed Options Presentation Slides >>](#)

 [Watch Project Overview Video >>](#)

 [EFC Homepage >>](#)



Helps match project funding sources based on organization type and desired funding category