Overview

- Introduction
- Hazard Mitigation Program Overview
- Nonpoint Source Program Overview
- Planning Goals and Processes
- Benefits of Partnerships
- Common Ground
- Collaboration
- Funding
- Resources
Introduction

Similarities were noted among 319 and HMA projects. Many mitigation projects promote water quality and protection, and many 319 projects mitigate flood risk.

Planning goals and processes are similar between 319 and HMA requirements.

Collaboration may save duplicated efforts and share resources that can benefit both programs.
FEMA Hazard Mitigation Assistance Program
FEMA Hazard Mitigation Assistance Program

• **HMGP**: Authorized under The Robert T. Stafford Disaster Relief and Emergency Assistance Act (1988), constitutes the statutory authority for most Federal disaster response activities especially as they pertain to the Federal Emergency Management Agency (FEMA) and FEMA programs.

• **DMA2000**: DMA 2000 amended the Stafford Act by replacing the previous mitigation planning requirements with requirements that emphasize the need for State, local, and Indian Tribal entities to closely coordinate mitigation planning and implementation efforts. **The requirement for a State mitigation plan is continued as a condition of disaster assistance.** DMA 2000 also established a new requirement for **local mitigation plans** and authorized up to 7 percent of HMGP funds available to a State for development of State, local, and Indian Tribal mitigation plans.
Hazard Mitigation Planning Process
FEMA Hazard Mitigation Assistance Program

Hazard Mitigation is any sustained action which is performed to eliminate or reduce long-term risks to human life and property from natural and technological hazards.

- Hazard Mitigation Grant Program (HMGP): Post – Disaster Mitigation Grants
  - 75% federal/ 12% state/ 13% local cost shares
- Pre-Disaster Mitigation (PDM): Annual Grant Cycle, 75% federal/ 25% local
  - Non-flood related hazards, i.e. safe room, seismic retrofit, critical facility generator
  - Flood projects for uninsured properties
- Flood Mitigation Assistance (FMA): Annual Grant cycle, 75% federal/ 25% local
  - NFIP – insured properties
  - Severe Repetitive Loss (SRL): 100% federal
  - Repetitive Loss (RL): 90% federal/ 10% local
Eligible Mitigation Activities

Includes, but not limited to:

- Local & State Plans
- Acquisition/Demolition
- Acquisition/Relocation
- Mitigation Reconstruction
- Structural Elevation
- Detention/Retention Basins
- Drainage Improvement
- Soil Stabilization
- Tornado Safe Rooms
- Early Warning Systems
- Critical Facility Generators
- Educational Outreach
- Aquifer Storage & Recovery
- Floodplain & Stream Restoration
- Stormwater Storage & Diversion
- Dry Floodproofing (Historic/Non-residential)
- Flood Risk Reduction
- Seismic Retrofits
- Utility Relocation/Retrofit
- Wildfire Mitigation
- Post-Fire Recovery
- Post-Disaster Code Enforcement
Communities consider all alternatives for mitigating their losses. Once a technically feasible option is selected, an application for funding consideration may be submitted under an open mitigation program.

If selected for funding consideration, the cost effectiveness of the proposed project must be determined.

Cost effectiveness is established utilizing benefit cost analysis (BCA) methodologies that have been developed by FEMA for the various project types. FEMA provides tools, guidance, training, and technical support for the BCA of all natural hazards. If the project benefits outweigh the costs, it is cost effective.

An application is then assembled for submission to FEMA. Complete applications include photos, GPS coordinates, topo maps, DFIRMS, design plans, line item budgets, letters of commitment for matching funds, environmental effects, socio-economic effects, historic preservation considerations, signed assurances, and documentation of all past damages and cost estimates. Additional documentation may also be required.

The state (KYEM) submits the completed application package to FEMA for review and approval.
Soil Stabilization

Harrods Creek Bank Stabilization
Prospect KY Funded DR1746
Structural Elevation

Before/After Structural Elevation Funded FMA2014 (SRL)
Prospect KY
FMA2014 (SRL) Before Prospect KY

Structural Elevation in Progress
Structural Elevation

Road Elevation
Owensboro KY Funded DR1802
Structural Elevation & Green Infrastructure

Elevated Parking Lot & Stream Restoration
Louisville KY
Funded DR1855
Detention Basin

Elizabethtown KY
Funded DR1746

Before

In Progress

After
Detention Basins & Stream Restoration: Before

UK Lexington KY
Funded DR1818
Detention Basins & Stream Restoration: After
Nonpoint Source pollution is caused by rainfall or snowmelt moving over and through the ground, it picks up and carries natural and human-made pollutants, depositing them into lakes, rivers, wetlands, coastal waters and ground waters.
319 Nonpoint Source Management Program

Clean Water Act, provides funding for States, Tribes and Territories to implement approved Nonpoint Source Management Program

Reduce nonpoint source water pollution to help achieve and maintain beneficial uses of water, such as swimming or fishing

EPA-approved state Nonpoint Source Management Programs provide the framework for determining which activities are eligible for funding
Components of Effective State NPS Management Program

- Short- and long-term goals to restore and protect surface water and ground water
- Strengthens working partnerships
- Use statewide programs and on-the-ground projects to improve water quality
- Abate water quality impairments and protect threatened and high quality waters from NPS impacts
- Prioritization of waters and watersheds impaired by NPS pollution for protection
- Manages and implement its NPS management program efficiently and effectively, including necessary financial management
- Review and evaluate NPS management program
Watershed Planning Process

- Impairment and pollutant source identification
- Estimate of load reductions
- Description of management measures and the critical areas
- Estimate of technical and financial assistance needed
- Information and education component to enhance public understanding of WS planning and encourage participation
- Schedule for implementing nonpoint source management measures
- Interim measurable milestones for implementation
- Criteria to determine water quality improvement
- Monitor to evaluate effectiveness of WS plan implementation efforts
Section 319 Nonpoint Source Management

States may make funds available through subawards to:
- local governments
- tribal authorities
- cities, counties, regional development centers
- local school systems, colleges and universities
- local nonprofit organizations
- state agencies, federal agencies
- watershed groups
- for-profit groups and individuals

Funding supports:
- technical assistance to communities
- financial assistance
- technology transfer
- education
- training
- watershed plan development
- project implementation
Projects Eligible for NPS Funding

• Wetland creation/restoration
• Detention basin retrofit
• Bioinfiltration/bioretention basins
• Riparian buffer plantings/creations
• Enhanced swales
• Rain barrels / Rain gardens
• Streambank stabilizations
• Sediment basins
• **Downspout Disconnection**
• **Rainwater Harvesting** / **Rain Gardens** / **Planter Boxes**
• **Bioswales**
• **Permeable Pavements** / pavers
• **Green Streets and Alleys** / **Green Parking**
• **Green Roofs** / **Urban Tree Canopy**
• **Land Conservation** / purchase
• Population growth
• Community development
• Roads
• Buildings
• Parking lots
• Outdated infrastructure
Nature Scaping Co-Benefits

<table>
<thead>
<tr>
<th>GI and LID Example Best Management Practices</th>
<th>Natural Hazard Mitigation</th>
<th>Co-Benefits</th>
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<tbody>
<tr>
<td></td>
<td>Flood</td>
<td>Fire</td>
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<tr>
<td>Minimize Impervious Area</td>
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</tr>
<tr>
<td>Limit Disturbance of Undeveloped Land</td>
<td>![Half-Circle]</td>
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<tr>
<td>Prevent Runoff from Landscape and Hardscape Areas</td>
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<td>![Half-Circle]</td>
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<tr>
<td>Protect Land and Ecosystems</td>
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Source: *Best Management Practice from Low Impact Development in Western Oregon: A Practical Guide for Watershed Health* with CSC additions. Co-Benefit scoring from CSC research and should be interpreted as opportunities for further investigation.
Natural Ground Cover vs Impervious Surfaces
Natural Ground Cover vs Impervious Surfaces
Stormwater Runoff
Green Infrastructure

Cost-effective, resilient approach to managing wet weather impacts that provides many community benefits.

Approach to stormwater management and flood mitigation that provides areas for infiltration or evaporation, rather than surface runoff that leads to flooding.

*Volume-based BMPs Focused on Reducing Stream Erosion*

Multi-benefit solution linking water quality improvement and stormwater / flood management
Bioinfiltration
Bioretention
Tree Canopy

- Intercept, and evapotranspire significant amounts of water
- Trees filter pollutants
- Canopies shade and cool paved surfaces
Low Impact Development

**Flow Control:** The regulation of stormwater runoff flow rates.

**Detention:** The temporary storage of stormwater runoff in underground vaults, ponds, or depressed areas to allow for sedimentation of suspended solids.

**Retention:** The storage of stormwater runoff on site to allow for sedimentation of suspended solids.

**Filtration:** The sequestration of sediment from stormwater runoff through a porous media such as sand, a fibrous root system, or a man-made filter.

**Infiltration:** The vertical movement of stormwater runoff through soil, recharging groundwater.

**Treatment:** Processes that utilize phytoremediation or bacterial colonies to metabolize contaminants in stormwater runoff.
319 Stormwater Project

- McConnell Springs is located inside the City of Lexington

- The spring is a National Registered Historic Site

- KDOW’s 2010 303(d) list of waters for Kentucky shows eight streams in the South Elkhorn Creek watershed do not support the Primary Contact Recreation use due to pathogen indicators, specifically fecal coliform

- **McConnell Springs**, which did not appear on the 2010 303(d) list was found to be impaired for pathogens (fecal coliform)
Sources for McConnell Springs include:

- **Urban runoff from developed areas** and non-developed areas for landcover distribution for McConnell Springs. This includes domestic pets and urban wildlife. **MS4s include the Lexington MS4 and the KYTC MS4**, and the **University of Kentucky MS4**

- Sewage from SSOs and sewer cross-connections

- OWTSs, including those possibly failing

- **The Red Mile Racetrack**
Nonpoint Source Solutions for Stormwater Pollution

- Clean Water Act, Section 319(h) funding was used to divert and reduce stormwater flow into McConnell Springs
- $314,000 in 319(h) grant was used to construct a stormwater quality, floating wetland pond
- McConnell Springs:
  - Active citizen group (Friends of McConnell Springs)
  - Nature/Education center
  - Recreational attractions
  - Venue for local activities
Gunpowder Creek Watershed

- Boone County, KY
- Flows into the Ohio River
- Largest watershed in the county- rapidly developing with continued growth expected
- Water impaired for sediment, bacteria, and nutrients
- Result: streambank erosion/instability, excess sedimentation, degraded biological communities, and loss of ecological function
- Developed portions have an extremely large volume of stormwater runoff
- Erosivity – Turbidity - Water quality degradation

*High volume + High rate of discharge = High erosivity of stream banks*
YMCA Bankfull Wetland

Project Location: YMCA Camp Ernst
Watershed: Gunpowder Creek
Drainage Area: 16 square miles
Funding: $596,056

Description: As one of the first implementation projects of the Gunpowder Creek Watershed Plan, this wetland provides habitat and water quality benefits, as well as reduced streambed disturbance by offloading flow that would otherwise contribute to channel erosion.

Project Highlights:
- The wetland restores 5 to 7 acre feet of floodplain storage in a previously disconnected floodplain.
- Historic USGS gage data suggest the wetland should decrease the frequency of streambed disturbance by up to 20%.
- In-stream sediment mobility monitoring validates the critical flow estimate (Qcrit) for this site, which was used to optimize the design to maximize the in-stream benefits associated with this project.

Receiving Stream: Gunpowder Creek is listed as impaired on Kentucky’s 305(b) list for sediment, bacteria, and nutrients.

Educational Opportunities: Interactions with nature leave lasting impressions and memories on local youth attending Camp Ernst. The wetland will provide an outdoor classroom supplemented by signage and learning stations.


Habitat: Wetlands provide habitat for a wide variety and abundance of wildlife and plants.
Boone County Conservation District developed Gunpowder Creek Watershed Initiative with NPS Funding

- KY Division of Water
- Sanitation District No. 1 of Northern KY
- Boone County Planning Commission
- Northern KY Univ. Center for Environmental Restoration
- Boone County Fiscal Court
- City of Florence, KY / City of Union, KY
- KY Transportation Cabinet
- Kenton County Airport Board
- Northern KY Area Development District
- Northern KY Health Department
- Citizen Groups
Water Quality and Natural Hazard Links

- NPS pollution is intensified by many natural hazards
- Restoration of natural hydrology can improve water quality while reducing flood risks
- Include hazard mitigation considerations in watershed planning
- Include water quality considerations in hazard mitigation projects
- Nature-based infrastructure can help reduce impact of flooding
- Water quality programs can play an important role in shaping these projects
Benefits of Partnerships

- Commonalities in watershed and hazard mitigation planning for funding
- Better alignment of plans and resources to reduce impact of flooding and improve water quality
- Collaborative solutions
- Awareness (resources/issues)
- Community economics
Common Ground: Planning

EPA 319 funding requires a state plan and localized watershed plans that are developed by stakeholders to assess needs and identify needed projects.

FEMA HMA funding requires a state and local (or multi-jurisdictional) plans that are developed by stakeholders to assess needs and identify needed projects.

Could collaboration in the planning process reduce duplication of resources?
EPA promotes the use of Low Impact Development (LID) and Green Infrastructure (GI) as a cost-effective and resilient approach to stormwater management. LID/GI provides many community benefits including cleaner water, wildlife habitat, enhanced aesthetics, and can be designed to supplement localized or watershed flood protection.

LID/GI projects that reduce flood losses to properties insured under the National Flood Insurance Program (NFIP) may be eligible for grant funding through FEMA. In addition, LID/GI projects may allow a community to claim points toward flood insurance discounts.

Common Ground: EPA & CRS

LID/GI projects may allow a community to claim points under the Community Rating System (CRS) developed by FEMA. CRS is an incentive program to encourage floodplain management that exceeds the minimum requirements. Accrual of points can reduce NFIP insurance rates up to 45%. Thus, the CRS rewards communities that enhance their resilience to flooding.

LID/GI protect streams and floodplains, and EPA encourages communities to take advantage of the discounts available from FEMA for these types of projects.

EPA-FEMA Collaboration: Strengthening Support for Nature-Based Infrastructure

- MOU with FEMA & EPA Office of Community Revitalization connects EPA programs, expertise with FEMA and other federal programs for disaster recovery and mitigation

- OCR has supported communities in resilience planning connected to HMPs

- EPA/FEMA supported pilots in several Regions to integrate Green and Nature-Based Infrastructure into local or state HMPs.

- National Estuary Program: resilience planning and connecting CCMPs with HMPs

- Wetlands: connecting efforts to restore wetlands, reduce coastal wetland loss to HMP
EPA-FEMA Collaboration: Strengthening Support for Nature-Based Infrastructure

- Watershed planning tools, e.g., healthy watersheds, RPS, can help target efforts

- EPA-FEMA “how to” guide for integrating water programs with HMP (underway)

- EPA participates on Federal Interagency “Silver Jackets” team run by USACE

- Each state has a Silver Jackets team focused on flood risk management
  - Typically led by the SHMO or State Floodplain Manager
  - Includes relevant federal and state agencies including HUD, Federal Highways, State DOTs, etc.
FEMA recently incorporated into HMP guidance:

- More integrated planning including natural resource planning
- Future conditions considerations including impervious area expansion
- Financial benefits for plans that exceed the minimum requirements

FEMA promotes “green” approaches and assigns value to ecosystem services for Benefit/Cost estimation – easier for projects to meet threshold.

These Actions Create New Opportunities for Communities

- Leverage FEMA funds for watershed projects with co-benefits
- Multi-agency support for projects with co-benefits
Federal Funding Sources

- Department of Energy (DOE)
- Department of Housing and Urban Development (HUD)
- Department of the Interior (DOI)
- Department of Transportation (DOT)
- National Oceanic and Atmospheric Administration (NOAA)
- U.S. Department of Agriculture (USDA)
- U.S. Economic Development Administration (EDA)
- U.S. Environmental Protection Agency (EPA)

www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities
# Federal and State Partners

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<th>State Partners</th>
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<tr>
<td>United States Army Corps of Engineers</td>
<td>KY Division of Water</td>
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<td>USDA</td>
<td>KY Transportation Cabinet</td>
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<td>US Forest Service</td>
<td>KY Division of Forestry</td>
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<td>National Park Service</td>
<td>Department of Local Government</td>
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<td>USFWS</td>
<td>KY League of Cities</td>
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<td>USGS</td>
<td>Area Development Districts</td>
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Trust for Public Land

Water Environment Federation

National Recreation and Park Association

Low Impact Development Center

Link to Green Infrastructure Collaborative Support
Resources


Wetlands Protecting Life And Property From Flooding: https://nepis.epa.gov/Exe/ZyPDF.cgi/2000D2PB.PDF?Dockey=2000D2PB.PDF

Improving Community Resiliency with Green Infrastructure: www.epa.gov/water-research/improving-community-resiliency-green-infrastructure


Stormwater Runoff Calculator: www.epa.gov/water-research/national-stormwater-calculator

Resources

Flood Mitigation Case Studies, Community Blog, and Information: [www.floodeconomics.com](http://www.floodeconomics.com)

Green Infrastructure Fact Sheet: [www.fema.gov/media-library-data/1487161212568](http://www.fema.gov/media-library-data/1487161212568)

Green Infrastructure Lessons from Science and Practice: [www.researchgate.net/publication](http://www.researchgate.net/publication)


Floodplain and Stream Restoration: [www.fema.gov/media-library-data/1470913956065](http://www.fema.gov/media-library-data/1470913956065)

Flood Diversion and Storage: [www.fema.gov/media-library-data/1470913868787](http://www.fema.gov/media-library-data/1470913868787)

Flood Mitigation Case Studies, Community Blog, and Information: [www.floodeconomics.com](http://www.floodeconomics.com)

Green Infrastructure Fact Sheet: [www.fema.gov/media-library-data/1487161212568-3b313a4502545a8cf6846f36d53e1367/GI_Fact_Sheet_Feb2017_COMPLIANT.pdf](http://www.fema.gov/media-library-data/1487161212568-3b313a4502545a8cf6846f36d53e1367/GI_Fact_Sheet_Feb2017_COMPLIANT.pdf)
