Environmental Protection Agency

Silver Jackets Webinar Series
Partnering Opportunities No. 3

May 24, 2017
Lisa Hair

- PE Employed by U.S. EPA’s Office of Water in Non-Point Source Branch
- Her role is to protect water quality by encouraging communities to adopt environmentally-friendly storm water management and related policies
- Previously a consulting engineer with CH2M HILL in wastewater and storm water treatment
- Worked for Metropolitan Nashville Tennessee
- Silver Jackets HQ point of contact for EPA.
- Master’s Degree in Environmental Engineering from Virginia Tech
Ken Henderson

• Lead for Green Infrastructure at the US EPA Mid-Atlantic Region in the Water Protection Division.
• Works with states, communities, and other partners to address stormwater challenges using green infrastructure.
• Includes managing grant programs like the Green Streets, Green Jobs, Green Towns (G3) Partnership, and other resources.
Abby Hall

• Works for U.S. EPA’s Office of Sustainable Communities in San Francisco.
• Manages the Greening America’s Communities program that provides green infrastructure design.
• Works on issues of disaster resilience and manages a partnership between EPA and FEMA to support better disaster recovery and long-term resilience planning.
• Master’s degree in Anthropology from Stanford University with a focus on land use and environmental policy.
EPA-FEMA Projects on Nature-based Flood Risk Management (LID/GI) in Hazard Mitigation Plans

Lisa Hair, PE – US EPA HQ Office of Water
Kenneth Hendrickson – US EPA Region 3
Abby Hall – US EPA HQ Office of Water, Region 9

May 24, 2017
Current and Potential Topics for EPA/USACE Collaborations in Flood Risk Management

- Water/Wastewater facility flood proofing
- Wetlands programs
- Silver Jackets projects: New Orleans; New Hampshire; DC; Huntington WV
- Peer review
- National Disaster Recovery Framework
- Federal Interagency Floodplain Management Task Force
- FEMA/EPA MOU
- Collaborations USDA, DOT, NOAA, USFWS
- Superfund site flood studies
- NPDES stormwater permits
- Non-point source programs/watershed planning
Overview of Today’s Webinar

- EPA/FEMA Pilots for LID/GI In Hazard Mitigation Plans – Lisa Hair

- Presentation on the Huntington, WV, Pilot for LID/GI in Hazard Mitigation Plans – Ken Hendrickson

- FEMA/EPA MOU - Abby Hall

Green Infrastructure and Low Impact Development

- Management that protects, restores, or mimics the natural water cycle
- Practices that minimize disturbance of natural vegetation and drainage, mimic pre-development patterns

Source: University of Oregon Community Service Center

- Johnson Creek Watershed, City of Portland
- N. Gary Ave. Portland Pilot Project
- Ocean County Soil Conservation District
Non-Point Source (NPS) Pollution, Water Quality and LID/GI

• EPA seeks voluntary adoption
  • Information, Grants, Technical Assistance
  • EPA Regional staff to support the State Non-Point Source Coordinators.

• Regulatory tools for LID/GI include:
  • Stormwater permits negotiated with entities
  • Consent decree negotiated projects

• Non-regulatory tools include: Section 319 CWA Non-point source (NPS) program and grants

Voluntary adoption of LID/GI is needed to protect water quality—hence EPA’s interest in a hazard mitigation co-benefit approach
<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>Minimize Impervious Area</td>
<td>Flood</td>
<td>Water Quality</td>
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<td>Limit Disturbance of Undeveloped Land</td>
<td>Fire</td>
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<td>Prevent Runoff from Landscape and Hardscape Areas</td>
<td>Landslide</td>
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<td>Protect Land and Ecosystems</td>
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Source: University of Oregon Community Service Center
FEMA’s Recommended Planning Process

Traditional approach:

Team:
- Emergency manager
- Public works
- Fire/policy
- Community planning
- Natural resources manager

Strategies
- Culvert
- Levee
- Hardened infrastructure

Updated approach:

Team:
- Emergency manager
- Public works
- Fire/policy
- Community planning
- Natural resources manager
- Floodplain manager
- Water quality specialist

Strategies
- GI/LID
- Engineering with nature

Source: University of Oregon Community Service Center
### EPA and FEMA Goals

**EPA (United States Environmental Protection Agency)**
- Endangered and Threatened Species Habitat
- Nonpoint source pollution
- DEQ TMDL and MS4 permit

**FEMA (U.S. Department of Homeland Security)**
- Pre-disaster mitigation planning
- Reduce hazard exposure to people and property
- New projects designed to increase ecosystem service benefits

Source: University of Oregon Community Service Center
Project Desired Outcomes

- Expand the range of tools used to mitigate flood and other natural hazard risk
- Institutionalize green infrastructure and low impact development (GI/LID) into natural hazard risk management planning
- Enable FEMA funds to be directed to GI/LID projects
- Promote the understanding of the co-benefits of GI/LID including:
  - Improved water quality, climate mitigation, habitat protection, air quality, and quality of life
Approaches to Shape LID/GI Actions

- Local plans and regulations
- Structure and Infrastructure projects
- Natural systems protection
- Education and awareness programs

Source: University of Oregon Community Service Center
EPA Planned Future Efforts to Develop Integration

- Collaborate with FEMA and partners on outreach

- EPA's tools to evaluate include:
  - EPA's Non-Point Source Program (Section 319 CWA) guidance
  - MS4 Permits - DC permit has flood program language that benefits the city
  - HQ and Regional outreach and program support

Pilot Plan Process and Goals

- EPA’s NPS Program and Smart Growth for WQ and development

- EPA & FEMA Regional team get local/state partner open to adding green solutions to their portfolio

- Regional teams submitted proposals

Albany, NY, is currently completing design on major flood mitigation projects to address a history of flooding.
Pilot Project Information

- State of Massachusetts
- Huntington, WV Silver Jackets
- Ashland, OR
- Albany, NY

Upland aquifers dominated by thin deposits of surface till – make up 70% of active and dynamic storage for region – UMassAmherst 2017

Overview of State of Massachusetts Drought Pilot

- State partners – SHMO, MEMA Mitigation Unit, MA Office of Energy and Environmental Affairs, others

- Support MA Executive Order to develop climate change strategy - HMP update to be a Climate Adaptation Plan

- Trust for Public Land Climate Smart Cities™ Boston (underway)
Site Suitability Analysis (GIS based)

- Wetlands and Rivers
  - Preferred criteria: >50 ft away (≥100 ft preferred)

- Flood Zones
  - Preferred criteria: >100 ft away (≥200 ft preferred)

- Flood Zones
  - Outside of 100 yr flood

- Contaminated Sites
  - No contaminated sites

- Soil (HSG)
  - HSG A and B

- Surficial Geology
  - Sand/gravel

- Depth to Groundwater/Bedrock
  - > 4 ft separation

- Depth to Bedrock
  - > 4 ft separation
Site and Implementation Suitability Combined (GIS based)

Site Suitability Score =

Recharge Suitability +

Implementation Suitability +

Recharge Capture Suitability

Weight criteria to focus the analysis as needed.
Using the TPL Climate Smart Cities Tool in Massachusetts

• Add/use data layers
• Run a query for site suitability
• Answer the question: Where are there potentially suitable locations for GI infiltration practices?
• Next steps after TPL tool:
  • Parcel additional analysis and site visits, prioritization
  • Evaluate methodology for Commonwealth-wide suitability for local government
Green Infrastructure for Drought Resilience in MA NHMP

- Green Infrastructure for drought resilience optimization mapping
- Provide feedback on the state policies and regulations barriers and opportunities analysis
- Identify options for the Commonwealth to become more resilient to drought
Overview of Ashland, Oregon, Pilot

- Interagency agreement

- Oregon Community Service Center’s Oregon Partnership for Disaster Resilience (OPDR).

- National Marine Fisheries “Reasonable and Prudent Alternatives” (draft) ESA - NFIP

- FEMA support for GIS analysis and ecosystem service valuation
Future Collaboration Opportunities

• Fits EPA’s and USACE’s missions

• High enthusiasm to include some green solutions in Hazard Mitigation Plans - much work needed

• EPA Regions may have tools and contacts to assist in project identification and delivery
Green Infrastructure
In Local Hazard Mitigation Planning
Huntington, West Virginia

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Partnering Opportunities No. 3 -
Environmental Protection Agency

Ken Hendrickson, Green Infrastructure Lead
Office of State & Watershed Partnerships
US EPA Region 3
What is Green Infrastructure?
Image from: “Greening the Grid” Winner – Philadelphia Soak It Up – Design Competition
What is Green Infrastructure?

- Decentralized practices and stormwater management approaches
- Natural systems & engineered practices that mimic natural systems
- Capture rainwater closer to where it falls
- Provides multiple economic and community benefits
Green Infrastructure & Scale

- Basin / Region / Watershed Scale
- City Scale
- Neighborhood Scale
- Site Scale
Project History

• Huntington, WV – An EPA Making a Visible Difference Community

• History of local flooding and stormwater issues

• Timing – Hazard Mitigation Plan updates due in 2017

• Interested Partners!

• Silver Jackets proposal
Partners

• West Virginia Region II Planning & Development Council
• KYOVA Interstate Planning Commission
• Huntington Stormwater Utility
• FEMA Region 3
• USACE – Huntington District
• EPA Region 3
Additional Outreach

• Marshall University
• Local Watershed Association
• Floodplain Managers
• WV – Division of Homeland Security and Emergency management.
• WV – DEP
• USDA – NRCS
• Conservation District
Flooding in Huntington, WV

Images From: Chris Chiles, Executive Director – WV Region 2 Planning & Development Council
Our Approach

• Form a planning team of partners & stakeholders

• Understand the needs and approach to stormwater management, flooding, and green infrastructure in Huntington (Stakeholder meetings)

• Develop a guide for GI in Hazard Mitigation Planning
Our Approach

- Encourage stakeholder discussions across issues (flooding, regulatory, hazard mitigation)
- Develop a GIS-based Planning Tool
- Stormwater, Green Infrastructure, and Flooding Workshops – Silver Jackets Team
- Green street community design charrette
Where we are now

• Kick Off Meeting in Huntington in July 2016
• Silver Jackets Proposal was awarded!
• Regular calls with the Planning Team
• Stakeholder Meeting in Nov 2016
• Working with a contractor to develop the guide – first draft scheduled for April 2017
• Started working on GIS model
Where we are headed

• Complete stakeholder interviews - June 2017
• Green Street Charrette - July 2017
• Stormwater / GI / Flooding Workshops (July – Nov 2017) – Silver Jackets Team
• Complete the Guide to GI in Hazard Mitigation Planning by September 2017
• Complete the GIS Tool / Model by October 2017
GIS Planning Tool for Identifying GI Opportunities

• Identify areas where green infrastructure can mitigate flooding and improve water quality
• Data from Huntington, FEMA, USACE, EPA
• Collaborative effort with USACE
• House the end product on a Watershed Resources Registry (WRR) currently being developed for WV
To begin, please follow the steps below:

- Use the 'Address Locator' tool or 'Zoom/Pan' tools above to find your location.
- Select the 'Find Opportunities' tool to locate resources within the study area.
- Select the 'Location Details' tool above and then click the location of interest on the map.

http://watershedresourcesregistry.com/
Lessons Learned

• Getting partners involved in the discussion is the first step toward success
• Combining resources strategically
• Understanding how partners see the issue
• Stakeholders appreciate the opportunity to get multiple perspectives on related issues
• The value of long-term partnerships
Thank You

• Our local, Regional, State, and Federal Partners make this effort possible

• USACE Silver Jackets for supporting collaboration!

Ken Hendrickson, Green Infrastructure Lead
Office of State & Watershed Partnerships
US EPA Region 3
EPA’s Partnership with FEMA on Planning for Disaster Resilience

Abby Hall
U.S. EPA Office of Sustainable Communities

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Memorandum of Agreement

• First signed in 2011
  • Following floods and tornadoes in Iowa in 2008
  • Smart growth, green infrastructure, and green building practices in long-term recovery

• Renewed in 2016

• What does EPA bring to hazard mitigation and disaster recovery?
  • Technical assistance for states, tribes, and locals
  • Tie recovery to mitigation & tie disaster planning to other community goals
Purpose of the MOA

• Sets up coordination of activities between EPA's sustainable communities, smart growth, environmental, and community technical assistance programs and FEMA's disaster recovery planning and hazard mitigation programs.

• Seeks to provide lessons learned for EPA, FEMA, and other federal agencies that can be used to build a stronger federal framework for mitigation planning as well as pre- and post-disaster recovery planning and operations.

• Seeks to provide a collaborative framework for policy work related to both hazard mitigation planning and climate change adaptation to create more resilient communities.
Past Projects

• Vermont
  • Tropical Storm Irene in 2011
  • Incorporating smart growth principles into state policies, local development regulations, and Hazard Mitigation Plans

• Wilmington and New Bern, North Carolina
  • 2012 with NOAA
  • Land use and infrastructure strategies to reduce vulnerability
  • Including green infrastructure for stormwater management
Flood Resilience Checklist

| 4. Do all community plans consider possible impacts of climate change on areas that are likely to be flooded? | □ Yes □ No |
| 5. Are structural flood mitigation approaches (such as repairing bridges, culverts, and levees) and non-structural approaches (such as green infrastructure) that require significant investment of resources coordinated with local capital improvement plans and prioritized in the budget? | □ Yes □ No |
| 6. Does the community participate in the National Flood Insurance Program Community Rating System? | □ Yes □ No |

Conservation Land and Discourage Development in River Corridors


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1. Has the community implemented non-regulatory strategies to conserve land in river corridors, such as:
   a. Acquisition of land (or conservation easements on land) to allow for stormwater absorption, river channel adjustment, or other flood resilience benefits? □ Yes □ No
   b. Buyouts of properties that are frequently flooded? □ Yes □ No
   c. Transfer of development rights program that targets flood-prone areas as sending areas and safer areas as receiving areas? □ Yes □ No
   d. Tax incentives for conserving vulnerable land? □ Yes □ No
   e. Incentives for restoring riparian and wetland vegetation in areas subject to erosion and flooding? □ Yes □ No

2. Has the community encouraged agricultural and other landowners to implement pre-disaster mitigation measures, such as:
   a. Storing hay bales and equipment in areas less likely to be flooded? □ Yes □ No
Past Projects

• San Francisco Bay Area, California
  • Association of Bay Area Governments
  • Resilience to earthquakes, sea level rise, and floods in regional and local land use planning, focused on vulnerable housing

• Long Island, New York
  • Hurricane Sandy 2012
  • Resilient Zoning and Building Codes; Ecosystem Service Valuation; Health Impact Assessment; and scenario planning.
Regional Partnerships for Resilience

- Group of EPA staff across HQ and 10 Regions meet monthly.
- Many have formal and informal partnerships with other federal agencies focused on resilience.
- Respond to disasters through NDRF and conduct joint technical assistance projects with states and communities.
Recent & Upcoming Projects

Building Blocks for Sustainable Communities
- Myrtle Beach, SC
- Wareham, MA
- Logansport, MA
- Pocomoke City, MD
- Skykomish, WA

FEMA Recovery
- Commonwealth of the Northern Mariana Islands
- Nassau and Suffolk County, Long Island
Greening America’s Communities

- **Columbia, South Carolina**, will create designs to protect an urban stream and create a greenway to minimize flooding in the Capital City Mill District.

- **Brownsville, Texas**, will add green infrastructure along the U.S.-Mexico border to manage stormwater and add shade and plants to cool an area experiencing higher temperatures due to climate change.

- **Oklahoma City, Oklahoma**, will use green infrastructure to minimize flooding from a local stream and make improvements to streets in four neighborhoods.

- **Honolulu, Hawaii**, will receive assistance to design street improvements and green infrastructure to address groundwater intrusion from sea level rise.

- **Multnomah County, Oregon**, will create designs for streets and public spaces in the Jade District to address heat island and air quality issues, manage stormwater and bolster redevelopment.
California Regional Resilience Framework

• Create a clear, actionable plan for building regional-scale resilience.
• Disasters happen at a larger geographic scale, and many solutions work better at the larger scale, too.
• Works for earthquakes, landslides, wildfires, drought, extreme heat, flooding, and sea level rise, and other local risks.
• We’ll help local consolidate and comply with federal and state planning requirements.
• Final products: California-specific tool, plus a national tool that can be used by other states.
Questions

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