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Hudson Estuary Watershed Resilience Project

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Catskill Creek at Woodstock Dam during low flow (L) and flood conditions (R)

Abstract

The Hudson Estuary Watershed Resiliency Project is a flood outreach and educational initiative serving municipal and landowner audiences in target watersheds in the Hudson Valley. The project is a collaborative effort between NY Water Resources Institute, the NYS DEC Hudson River Estuary Program and staff from Cornell Cooperative Extension associations in Columbia-Greene, Dutchess, Orange and Putnam Counties. During the course of 2013, the Hudson Valley Cornell Cooperative Extension regional team developed a comprehensive flood education initiative, conducted extensive outreach to partners and delivered programs to target audiences. The team identified educational materials for distribution, developed print materials, produced a website and created maps. The regional team assisted the Cornell Human Dimensions Research Unit with the creation of needs assessment instruments, conducted interviews with municipal officials and assisted with a landowner survey. The team developed a brief presentation for municipal officials and five in-depth presentations. The team delivered two Post Flood Stream Intervention trainings for highway personnel, co-hosted two conferences, provided presentations at one additional conference and hosted thirteen seminars with expert lecturers. Throughout the course of the year, the CCE regional team delivered over 2,000 hours of instruction to a total of 1,918 individuals.

Major Accomplishments

Municipal Presentations - The Hudson Valley Cornell Cooperative Extension team developed a brief presentation for municipal officials that provided key messages related to streams and flooding. The team researched and identified fact sheets and resources to include in a folder of information that was distributed during the brief presentations. In 2013, the Hudson Valley CCE team provided 88 brief presentations to Town and County boards on flood resiliency.

Seminar Series & Conferences – The Hudson Valley Cornell Cooperative Extension team organized and hosted thirteen seminars on a variety of topics, including the FEMA National Flood Insurance Program, Dam Safety, How Wetlands and Forests Reduce Flood Risk, Scenic Hudson’s Sea Level Rise Mapper and Streams 101. The seminars were held throughout the Hudson Valley. The Cornell Cooperative Extension team planned or provided presentations at three conferences, partnering with a variety of organizations, including the Hudson River Watershed Alliance and Cary Institute of Ecosystem Studies.

Post Flood Stream Intervention Trainings – The Hudson Valley Cornell Cooperative Extension team initiated a collaborative approach to offering the NYS DEC’s new Post Flood Stream Intervention Trainings in the Hudson Valley. Cornell Cooperative Extension staff coordinated planning of the training with a wide variety of partners, including NYS Department of Environmental Conservation, NYC Department of Environmental Protection, Natural Resource Conservation Service and the Lower Hudson Coalition of Conservation Districts. Two trainings were developed and delivered in 2013 to an audience of town and county highway personnel and agency staff. The two-day trainings included a day of classroom instruction and a day of experience in the field at flood damaged sites. The trainings were offered in Greene County, in partnership with Greene Soil and Water Conservation District (SWCD) and in Dutchess County in partnership with Dutchess SWCD.

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Introduction

Background and project need, audiences and relevance

Extreme weather, such as Tropical Storms Irene and Lee, and Hurricane Sandy have pointed out the need for communities to become more ready to respond effectively to flood events. The Hudson Estuary Watershed Resiliency Project (HEWRP) was established to deliver educational messages regarding flood readiness, stream dynamics and flood response in streams to audiences in the Hudson Valley.

The audience for the HEWRP is municipal officials, highway personnel and landowners in target watersheds in the Hudson Valley.

Although flood risk in the Hudson Valley is a long-standing issue, an increase in very heavy precipitation events is creating a greater need for communities to develop a more resilient approach to flood readiness and response. A needs assessment conducted by the Cornell Human Dimensions Research Unit and the Hudson Valley Cornell Cooperative Extension team points to the relevance of this project to communities in the Hudson Valley. The assessment indicates that while many municipal officials understand that flood risks are increasing, most communities are not yet addressing vulnerabilities to flooding. Furthermore, post flood response in streams after Tropical Storms Irene and Lee were often well-intentioned but poorly executed, which points to a need for greater understanding of fluvial geomorphology in target audiences. This project is relevant from a perspective of promoting community well-being and readiness, as well as protecting the integrity and functioning of stream systems in the Hudson Estuary watershed.

Program Description

Partners & collaborators, key elements of program, project goal(s), geographic area served by project (if applicable).

During 2013, the Hudson Valley Cornell Cooperative Extension (CCE) regional team developed a comprehensive flood outreach initiative, and delivered educational programs to target audiences. CCE of Columbia & Greene counties coordinated the

effort to plan and deliver the HEWRP, working in partnership with CCE associations in Dutchess, Orange & Putnam counties, NYS Water Resources Institute (WRI), the Hudson River Estuary Program, Cornell University and many other partners. Collaborators included Lower Hudson Coalition of Conservation Districts, NYC Department of Environmental Protection, NRCS, USGS, NYS DEC Office of Floodplain Management and Dam Safety Division and others. The CCE team collaborated with the Cornell Human Dimensions Research Unit to conduct needs assessments with municipal and landowner audiences.

Key elements of the program included a needs assessment and extensive outreach to municipal officials and highway personnel on topics related to streams and flooding. Outreach methods included seminars, conferences, presentations, trainings, print materials and website development.

The project goal is to develop capacity in Hudson Valley municipal officials, highway personnel, and riparian landowners to implement watershed resiliency strategies to minimize future flooding impacts, while also properly responding to storm impacts to streams and adjacent and associated infrastructure.

The geographic area served by this regional project included target watersheds in Albany, Columbia, Dutchess, Greene, Orange, Putnam, Rensselaer, Schoharie and Ulster counties.

Project Methods

Needs assessment (if applicable), audience characterization, literature review, educational materials development or adaptation, types of outreach employed in the project.

The CCE regional team assisted the Cornell Human Dimensions Research Unit (HDRU) with the creation of needs assessment instruments for municipal officials and landowners. CCE staff received IRB training and conducted interviews with municipal officials in the Hudson Valley. Thirty-seven interviews were conducted in total. The CCE

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regional team provided GIS and other support to HDRU on the landowner survey, which was sent to 2,000 streamside property owners in the Hudson Valley.

An extensive literature review was conducted, with staff from the Estuary Program, WRI and CCE contributing materials on stream stewardship, stream dynamics and flood resiliency to a Cornell Box location. Literature distributed to audiences were gleaned from the Cornell Box files.

The CCE team developed outreach materials including a project executive summary, tri-panel display, landowner flood preparedness documents and a website www.hudsonestuaryresilience.net. The team created GIS maps to help with the delivery of educational efforts. Lower Hudson Coalition of Conservation Districts produced a Municipal Flood Guide, working under a sub-contract with CCE Columbia-Greene.

The CCE team developed several presentations, including a brief presentation for town boards, a thirty minute presentation on the project, a one hour presentation on forests and flood resiliency, and a 1.5 hour stream dynamics presentation. The team worked with partners to adapt the NYS DEC Post Flood Stream Intervention Training into a two day workshop, which was delivered in Greene and Dutchess counties. The team delivered 88 brief presentations to town board and county officials and hosted thirteen seminars on a variety of topics, including culvert sizing, forests and wetlands for flood management and FEMA National Flood Insurance Program. The team participated in planning two conferences and provided presentations at three conferences. The tri-panel display was exhibited at 11 events, including county fairs. The CCE team recruited participants and volunteers for three Trees for Tribes plantings on flood damage stream banks and conducted one landowner outreach event.

Impacts and Results Numbers served, knowledge gained, behavior changes, audience feedback

Over the course of 2013, the Hudson Valley CCE regional team delivered over 2,000 hours of instruction to a total of 1,918 individuals.

The Hudson Estuary Watershed Resiliency Project was very well received by target audiences. Evaluations conducted with program attendees consistently showed increase in knowledge and attendees indicated that they found the programs to be worthwhile experiences. Quotes from program attendees were very positive. The following quotes are a few of the responses to the question: *Please list at least one (or more) concrete action(s) you will take as a result of this workshop.*

From the *Flood Management: New Strategies in a Changing Climate Forum*:

“I will continue to look for (and attend) other educational workshops/forums like this to learn how municipalities are handling the issue of climate change.”

{I will} “Encourage my town to re-do its comprehensive plan. As chair of planning board, I’ll insist all board members become familiar with this issue.”

From the *Post Flood Stream Intervention Trainings*:
“Not to be so quick to rip and tear with bulldozer and excavator.”

“Try to get stream bed back to its original space. Try not to dredge or use berms to control water flow.”

“Not use gravel berms as a flood control structure.”

Evaluation of the Post Flood Stream Intervention Training was conducted in partnership with Cornell HDRU and an article on the results was published in the *Journal of Extension* (see References).

Policy Implications

Discuss policy implications of your outreach. Describe how this outreach interfaces with existing and proposed laws/regulations or community actions.

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Potential long-term policy implications of the HEWRP include changes to zoning and code to include wetland and riparian buffer ordinances, and wiser floodplain management and post flood response in streams. Policies regarding stormwater management, participation in the FEMA Community Rating System and placement of roadway

infrastructure near streams may also be impacted over the long term.

References:

Allred, S., Gary, G., and LoGiudice, E. 2014 An Extension Education Program to Help Local Governments with Flood Adaptation. *Journal of Extension* 52 (4)

<http://www.joe.org/joe/2014august/iw6.php>

Appendices (if needed)

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