Title: Water Resources and Climate Change

Project Leader: Christine Hatch

Project Overview

Predictions for future climate in Massachusetts include two parameter shifts that are likely to have a significant impact on how water resources are managed in the state: 1) the entire northeast region is likely to receive more total precipitation, more of which will come as rain instead of snow, and 2) summers are likely to be warmer and drier. Both of these phenomena have already been observed in the climate record. Municipalities and managers are interested in planning for the future, and UMass Extension will assist by establishing a link between policy decisions and academic science. Rather than attempt to address every possible link between water resources and climate change, this project will be focused on three areas where the issues are timely, actionable, and have great potential for impact and benefit to Massachusetts. The following programmatic emphases are each associated with a set of independent activities, but there is also a significant degree of overlap among them.

1. Establishing a Fluvial Geomorphological Assessment (FGM) protocol in Massachusetts: Learning how to give rivers room to be rivers while living beside them.

2. Communities facing change: Think watershed, manage locally.

3. Maintaining resilient stream ecosystems in a changing climate: from surface-water groundwater interactions to stream temperature.

Activity Summary – 2014

- 2-day fieldtrip/class relating to streams, floods (and mathematics) for EUREKA! Girls Incorporated of Holyoke, MA, Smart Partners. (1)
- Climate Voices Network (1)
- Design and construction of Seepage Flume for investigation of surface water-groundwater interactions and stream temperature applications (1)
- Flood Resilience and Recovery Assistance: Lessons Learned from Vermont (webinar) (1)
- Fluvial Geomorphology workshop(3)
- Give public lectures about Water Resources and Climate Change (e.g. Pomfret School, NECSC and UMass’s Summer Institute in Leadership in Sustainability)(3)
- Represent UMass and RiverSmart Communities at the Deerfield/Franklin Regional Council Of Governments (FRCOG) “Creating Resilient Communities” group meetings(4)
- Serve as liaison for Water and Climate Science issues in Agriculture(1)
- Serve as liaison for Water and Climate Science issues between UMass (including Northeast Climate Science Center (NECSC - DOI), the New England Climate Center (UMass), and the Climate System Research Center (Geosciences)), stakeholders and the community(23)
- Stream Temperature and Flow Monitoring Workshop(1)

Total Educational contacts

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Narrative Summary and Impact

During FY14 I gave a number of workshops, led activities and presented public lectures aimed at increasing stakeholders’ knowledge about some of the likely impacts of climate change on our New England Region and beyond. Of these, major damage from flooding caused by Hurricane Irene is still fresh in people’s minds and offers an unprecedented opportunity to shape future policy that both prevents and/or limits damage to life and infrastructure from more intense storm events, while at the same time preserving the ecological integrity of our river systems. Together with many collaborators, I have begun and made major progress on an initiative to manage Massachusetts rivers in keeping with these goals. This project began as a WRRC sponsored workshop and an Integrated Research and Extension Project “RiverSmart Communities: Supporting ecologically restorative flood prevention and remediation in New England,” and has since attracted nearly two million dollars in extramural funds. By training students (K-12) in climate science and river science (through my involvement in public lectures, the Summer Institute in Leadership and Sustainability, Girls Inc. of Holyoke, MA and the Four Rivers Charter School in Greenfield, MA), I’m helping to prepare future generations for what they might expect from climate change in our region, so that they can address the problems that might result. These initial steps toward human and ecological resilience in the face of climate change represent important groundwork about overall perception of our water resources in the commonwealth.

Collaborating Organizations

- Massachusetts Geological Survey
- Deerfield Resilient Communities
- Girls Inc. of Holyoke, MA
- Summer Institute in Leadership in Sustainability (UMass)
- Climate Voices Network
- Franklin Regional Council Of Governments (FRCOG)
- Northeast Climate Science Center (NECSC - DOI)
- Climate System Research Center (UMass Geosciences)