



Massachusetts Water Resources Research Center

Funded Research in 2009

Continuing Projects

The MA WRRC continued to support the graduate student research project: *Bacterial Toxicity of Oxide Nanoparticles and Their Adhesion* by Wei Jiang with Dr. Baoshan Xing of UMass Amherst.

New Projects

The Water Center funded a research project headed by Dr. Chul Park of UMass Amherst entitled *Assessing the Transport and Fate of Effluent Organic Nitrogen in the Connecticut River and Long Island Sound Using Mass-Mapping Proteomics Technology*. The objective of this project was to conduct mass-mapping proteomics to characterize effluent proteins from two major dischargers to the CT River and to assess their transport and bioavailability in the CT River and Long Island Sound.

Two graduate student projects were also funded:

- *Characterization of Flow and Water Quality of Stormwater Runoff from a Green Roof* by Suzanne LePage with Dr. Paul Mathisen of Worcester Polytechnic Institute.
- *Impact of Nanoparticles on the Activated Sludge Process: Effects on Microbial Community Structure and Function* by Deepankar Goyal with Dr. Juliette Rooney-Varga of UMass Lowell.

Funded Research in 2010

The Water Center will fund a research project headed by Dr. Ellen Douglas of UMass Boston entitled *Developing a physically-based and policy-relevant river classification scheme for sustainable water and ecosystem management decisions*. One of the goals of this project is to provide a framework for estimating the total ecosystem service value that any particular riverine habitat has to the humans and ecosystems that benefit from it. The overall outcome of this work will be a decision support framework that is both physically-based and policy-relevant, which will be useful to environmental managers and policy-makers in assessing the degree to which ecosystems can or should be restored.

Four graduate student projects will also be funded:

- *An assessment methodology for differential impact on environmental justice populations of releases of industrial toxics to water in Massachusetts* under PI Dr. Michael Ash of UMass Amherst
- *Impact of the hemlock woolly adelgid on the water cycle in New England: Differences in hydrologic fluxes between hemlock and deciduous forest stands* under PI Dr. Andrew Guswa of Smith College;
- *Monitoring and Modeling Chromophoric Dissolved Organic Matter in Neponset River and Boston Harbor Using GIS and Hyperspectral Remote Sensing* under PI Qian Yu of UMass Amherst;

- *Surface water-groundwater interactions on the Deerfield River* under PI Dr. David Boutt of UMass Amherst.

WRRC Programs and Projects Update

The **Tri-State Connecticut River Watershed Initiative**. This project addresses, in a coordinated watershed-wide approach, major bacterial pollution from combined sewer overflows and urban stormwater, extensive streambank erosion, threats to public water supplies, and nutrient loading from agricultural runoff in four overall themes: Improving Main Stem Water Quality and Public Use, Innovative Financing for Stormwater Recharge and CSOs, Smart Growth and Low Impact Development, and Innovative Public Outreach and Participation. Within the scope of this project, monitoring data was made available to the public as soon as it was analyzed on the newly redeveloped website: <http://www.cesd.umass.edu/twi/>. This website will also host virtual tours of the Connecticut River watershed.



Rock Dam, Connecticut River, Turner's Falls, MA

The Center continues to work with UMass Extension on the **Stream Continuity Project** to examine the barrier effect created by road crossings on streams. The team is conducting pilot surveys of crossings in several watersheds, involving volunteers in developing an inventory of existing crossings. The project will result in a priority scheme for culvert replacement on a watershed basis.

The Center is also working on the **Massachusetts Stormwater Evaluation Project**, a stormwater clearinghouse project that enables users to search the web for stormwater Best Management Practices and to find innovative technologies available to treat stormwater (www.mastep.net).

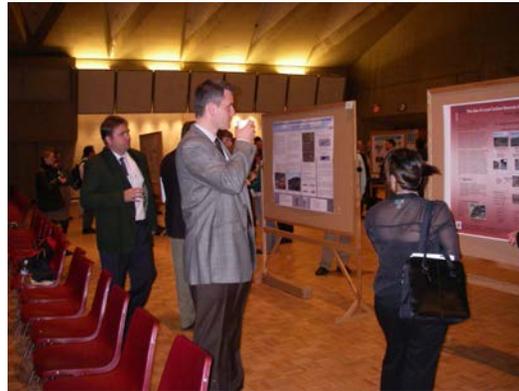
Conferences

The sixth annual conference, *Water Dependencies in New England: Systems, Stresses, and Responses*, was held April 7, 2009. Concurrent tracks examined Pharmaceuticals and Personal Care Products, among other topics.

On September 30, 2009, with the support of EPA, Mass DEP, TEI, and NEIWPCC, the WRRC convened the *Data Needs Workshop: Monitoring and Responding to Climate Change Impacts on Water Resources in New England*. In plenary sessions and breakout groups throughout the day, the 80 participants including leading experts, senior scientists and researchers from federal and state government, academia, NGOs, and other stakeholders identified and discussed data gaps and monitoring needs, prediction needs, and synthesis needs to effectively manage water resources in the face of climatic change in New England.

The seventh annual Conference, *Monitoring and Responding to Water Resource Challenge*, will be held April 8, 2010. The conference will address the needs for water monitoring, assessment, and management of water resources in New England in the face of variability due to changes in climate, land use, population, and other environmental stressors. For more information:

<http://www.umass.edu/tei/wrrc/WRRC2004/WRRConferences.html>



Smith's Dr. Guswa views student posters at the MAWRRC 2009 Conference

Interdisciplinary Working Groups

The WRRC Director leads the interdisciplinary Water Working Group, and staff also participates in other environmental working groups to facilitate interdisciplinary research and educational initiatives related to water.

Potential projects under development include water sensing of the environment, consequences of global change for water quality, and integrated programs to improve water quality.

EAL

WRRC runs an inorganic chemistry laboratory on campus, the Environmental Analysis Lab, which conducts a wide variety of analyses to support environmental research, management, and monitoring activities.

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http://www.umass.edu/tei/TEI_2005/EAL.html

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Volunteers on the Connecticut River, Sumner Falls, Hartland, VT