



WATER RESOURCES RESEARCH CENTER

MISSION

WRRC is a center within the College of Natural Sciences whose mission is to support research, education, and outreach on water resources issues of state, regional, and national importance as part of the national system of institutes authorized under the Water Resources Research Act of 1964.

VISION

- To serve as the liaison between federal, state and local representatives and water / environment expertise at UMass Amherst,
- To address water resources needs of the Commonwealth and New England through research, creative partnerships, and information transfer, and
- To actively engage federal and state agencies in inter-disciplinary University water resources research, education and outreach efforts.



RESEARCH

The Center supports faculty and graduate student research related to water resources including water quality, long-term environmental

monitoring, hydrologic modeling, watershed planning, management, protection, policy and the impacts of climate change.

2020 Research Awards

The Water Center selected one major project and four minor ones to fund under its Water Resources Institutes Program:

➤ **“Thermal Regeneration Technologies for Granular Activated Carbons Laden with Per- and Polyfluoroalkyl Substances,”** led by Dr. Onur Apul at UMass Lowell, will test granular activated carbon adsorbents for PFAS remediation. (\$50K)

➤ **“Investigating Dam Management Impacts to Downstream Fluvial Hydrology and Temperature,”** led by Dr. Allison Roy at UMass Amherst, will collect continuous, high-resolution discharge and temperature data below dams to help managers and policy makers consider previously overlooked downstream impacts when updating management guidelines. (\$15K)

➤ **“Manganese Sourcing and Transport in Massachusetts Groundwater: Understanding Dissolution Mechanisms and Creating a Temporally Variant Database,”** led by Drs. David Boutt and Justin Richardson at UMass Amherst, will collect manganese concentration data in wells to better understand the mechanisms of Mn dissolution. (\$10K)

➤ **“Testing the River Process Corridor in the Deerfield River Watershed, Massachusetts,”** led by Dr. Christine Hatch at UMass Amherst, will test a new method to

delineate river corridors, in order to protect these important ecosystems and plan for better infrastructure protection from floods and other natural hazards. (\$10K)

➤ **“Microplastic Pollution in Freshwater Systems: Impacts of Biofilm Formation of Microplastic Surface,”** led by Drs. Wan-Ting Chen and Sheree Pagsuyoin at UMass Lowell, will study a component of microplastics extraction from surface waters. (\$5K)

2019 Research Awards

The Water Center funded one major research grant and two minor ones under the USGS 104b program in 2019:

➤ **“Wireless Network of Smart Graphene Sensors for Large-Scale Monitoring of Water Heavy Metals,”** led by Dr. Jinglei Ping at the University of Massachusetts Amherst, will develop a wireless network of smart sensors for large-scale real-time monitoring of heavy metals in water bodies.

➤ **“Real-time Responsive Nutrient Loading Management in Urban Catchments through Sewer-Embedded Sensing and Controls,”** led by Dr. Amy Mueller of Northeastern University, will enable preliminary field testing of a set of inorganic chemistry sensors in stormwater sewers.

➤ **“Microbial Community Characterization and Pharmaceuticals Analysis of Agricultural Soils Irrigate with Calcium hydroxide (Lime)-Treated Urine from the Grow Food Northampton Community Garden in Florence, Massachusetts,”** led by Dr. David

Reckhow of the University of Massachusetts Amherst, will guide future best practices of managing treated urine in the irrigation of agricultural lands.

WATER RESOURCES RESEARCH SYMPOSIUM

In 2020, the WRRRC will work on:

➤ The North East Graduate Student Water Symposium

Following up on the success of the past seven years, we will again assist Dr. Reckhow at UMass Amherst and a steering committee composed of graduate students in organizing the North East Graduate Student Water Symposium. The symposium will bring undergraduate and graduate students engaged in water related research together from across the region to share their work, network, and interact with post docs, faculty, and industry representatives.

CURRENT PROJECTS

Acid Rain Monitoring Project

The Center coordinates annual volunteer sampling of 150 surface water sites across Massachusetts for analytes indicative of the long-term effects of acid deposition. The Center makes available the full ARM database (more than 40,000 records from nearly 4,000 lakes and stream collected since 1983) on the internet.

MassDEP-WRRRC Data Sharing Collaborative

MassDEP is looking to include in its assessment data collected by watershed groups and municipalities. Toward this goal, MassDEP entered into a collaborative partnership with the Water Resources Research Center to communicate with monitoring groups and assist in the technical review of Quality Assurance Project Plans (QAPP) and data submissions from those groups.

Blackstone River Water Quality Study

Since 2012, this study has included data collection, analysis and modeling of surface water flow and quality. Currently sampling is conducted April through November to determine nutrient and chlorophyll levels, dissolved oxygen, and river response to reduced pollutant loads.



Sampling the Blackstone River in Millbury

Assistance Program for Lead in School and Childcare Drinking Water

WRRRC is working with the Civil & Environmental Engineering Department at UMass Amherst on a collaborative project with MassDEP to provide free lead testing and technical assistance to public schools and public and private group child care centers. This is the third phase of the project and is aimed at lower income, older facilities serving children aged 6 and younger.



Environmental Analysis Laboratory

The EAL provides inorganic chemical analysis of water for University researchers, watershed organizations, and other publicly supported clients to support environmental research, management, and monitoring activities with a particular strength in the analysis of low-level phosphorus and chlorophyll *a*.

OUTREACH

WRRRC participates in projects such as the North Atlantic Aquatic Connectivity Collaborative (road-stream crossings assessment) and RiverSmart Communities (supporting New England communities to manage their river landscape to prevent flood and erosion damage while protecting river ecosystems).

CONTACT WRRRC

Marie-Françoise Hatte, MS
Interim Director
mfhatte@umass.edu

Cameron Richards, MS, GIST
Research Fellow
cameronr@umass.edu

209 Ag Engineering Bldg
250 Natural Resources Rd
Amherst, MA 01003-9295
USA

413-545-5531
wrrc@umass.edu
<http://wrrc.umass.edu/>



The WRRRC is affiliated with the Center for Agriculture, Food, and the Environment in the College of Natural Sciences at the University of Massachusetts Amherst.