



# WATER RESOURCES RESEARCH CENTER

## MISSION

In the University of Massachusetts' College of Natural Sciences, WRRC is a center 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 the 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

Through funding from the U.S. Geological Survey Water Resources Institutes Program (WRIP), the Center supports faculty and graduate student research on water resources including water quality, long-term environmental monitoring, hydrologic modeling, watershed planning, management, protection, policy and the impacts of climate change.

### 2022 Research Awards

The Water Center selected two major projects to fund under the USGS WRIP:

- **“Decreasing toxicity of DBPs in drinking water through light driven reaction,”** led by Dr. Mariana Lopes at UMass Lopes, will test the reduction of toxicity of disinfection byproducts (DBPs) in drinking water through practical ultraviolet light distribution in pipes at points of use. (\$50,000)
- **“Evaluating hydroclimatic controls on riverine flooding in New England using reanalysis data and model simulations,”** led by Dr. Samuel Muñoz at Northeastern University, will study ways to enhance understanding of how climate variability and change influence floods in rivers in New England. (\$50,000)

### 2021 Research Awards

- **“Revealing the drivers of water quality change in the critical zone amidst urban-ecological transitional systems using isotope tracers and ecohydrological comparison,”** led by Dr. Christian Guzman at UMass

Amherst, investigated the variability of the eco-hydrological conditions that delay or quicken the passage of water through a catchment as subsurface flow. (\$57,948K)

- **“Wetland water quality before and after restoration in Plymouth, MA,”** led by Dr. Christine Hatch at UMass Amherst, aimed to quantify the change in water quality from a fallow cranberry farm to a restored wetland. (\$14,980)
- **“Investigating dam removal as a tool to increase ecological resilience through water quality improvements,”** led by Dr. Allison Roy at UMass Amherst, quantified the impacts of dam removals on water quality in 16 Massachusetts streams. (\$15,000)
- **“Assessing the effectiveness of floodplain reconnection, a growing practice in river restoration,”** led by Dr. Anna Martini at Amherst College, evaluated water quality parameters in a floodplain restoration project in Amherst, MA. (\$10,000)
- **“Developing continuous sampling and drones as monitoring strategies of water flow, temperature and dissolved oxygen during low flow periods,”** led by Robert Stevenson at UMass Boston, documented flow and water quality in the Parker River watershed using traditional and new technology. (\$6,500)

## 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 the full ARM database (more than 40,000 records from nearly 4,000 lakes and streams sampled since 1983) available on the Internet.



Acid Rain Monitoring Project volunteer analyzing water samples for pH and alkalinity at home

## 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.



Measuring water quality in the Blackstone River

## Assistance Program for Lead in Drinking Water of School and Childcare Facilities

WRRC 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 and private schools, and to group child care centers as well as family child care facilities. This is the third phase of the project and is aimed at facilities serving children aged 6 and younger.



## Statewide Sampling for PFAS Contaminants in Drinking Water

WRRC staff joined the UMass team contracted by MassDEP to test drinking water in Public Water Supply sources and privately owned wells across the Commonwealth. Associate Director Hatte was the project manager on the UMass Amherst campus and Mr. Richards trained students to create GIS maps for locating good private well candidates for testing in towns where at least 60% of drinking water is provided by privately owned wells. This project ended June 30, 2022.

## 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

WRRC 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 WRRC

**Timothy Randhir, PhD**

Director

[randhir@eco.umass.edu](mailto:randhir@eco.umass.edu)

413-545-3969

**Marie-Françoise Hatte, MS**

Associate Director

[mfhatte@umass.edu](mailto:mfhatte@umass.edu)

**Cameron Richards, MS, GIST**

Research Fellow

[cameronr@umass.edu](mailto:cameronr@umass.edu)

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

413-545-5531

[wrrc@umass.edu](mailto:wrrc@umass.edu)

<http://wrrc.umass.edu/>

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



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