



# Vermont Water Resources and Lake Studies Center

The Vermont Water Resources and Lake Studies Center (Vermont Water Center) is one of 54 state water resources research institutes established by the Water Resources Research Act of 1964 and located at land-grant universities. Through cooperation with the U.S. Geological Survey's National Institutes for Water Resources, the Vermont Water Center leverages expertise in research, education, and outreach to address Vermont's water resource challenges.

The Vermont Water Center runs an annual competition to fund research projects that inform and impact important water resource issues. The Center shares research results with stakeholders and uses findings to educate Vermonters about state water resources. Projects are led by Vermont-based researchers.

## USGS-NIWR annual base funding to Vermont supports:

- 4-5 research projects per year that include training for about 5 graduate and 5 undergraduate students from a range of disciplines.
- About 3-5 peer-reviewed publications, 2-4 theses, and 12+ outreach products per year.
- A website and quarterly newsletter about recent ecological findings in Vermont ([www.econewsvt.org](http://www.econewsvt.org)).
- Scientific knowledge that informs water resources management in Vermont.
  - First published report of bloom-forming cyanobacteria in Vermont's high-elevation acid-impaired lakes will contribute to development and implementation of biotic indices for rapid assessment of water quality impairment.
  - Analyses of genetic material in riparian soil samples created a cutting-edge dataset that will be used to describe how soil microbial communities change according to land use and landscape position during spring snowmelt.
  - Research on the adaptation of freshwater whitefish to environmental variability will help understand the range of possible responses to climate change and assist managers to conserve fisheries.



Congressional  
Authorization:  
Water Resources  
Research Act of 1964  
(Public Law 88-379)

**FY 2022 Funding:**  
Federal Funds:  
\$133,770

Non-Federal Funds:  
\$133,770

Total Funds:  
\$267,540

Host:  
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Rubenstein School of  
Environment and Natural  
Resources

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[uvm.edu/rsenr/vtwater](http://uvm.edu/rsenr/vtwater)

# 2022 Research Projects



## Nutrient loading during winter and growing season high-flow events in different gauged watersheds of the Lake Champlain basin

Andrew Schroth & Graduate Student Sonya Vogel, University of Vermont

Warming winters increase the number and intensity of winter thaws and rain-on-snow events in Vermont. Researchers will gather water samples from five sites in Lake Champlain tributaries during winter high-flow events, analyze them for nitrogen and phosphorus, and compare them to other seasons' high-flow events. Findings will improve our understanding of the extent to which winter high-flow events contribute to nutrient loading in surface waters.

## Potential impacts on drinking water from road salt storage facilities in vulnerable communities

Stephanie Hurley, University of Vermont

Road salt storage facilities are concentrated, year-round locations of road salt which may be leaching salt into waterways and damaging ecosystems and animals. Use of road salt in Vermont and salt concentrations in certain waterways are both increasing and locations of storage facilities are currently undocumented. Researchers will create a salt storage facility geospatial database available to the public and evaluate the risks that salt storage facilities pose to ecosystems and communities, especially vulnerable communities.

## Food web responses to Round Goby and Quagga Mussel invasions across the gradient of lake types within the Lake Champlain ecosystem

Jason Stockwell, University of Vermont

Although not yet found in Lake Champlain, non-native and invasive Round Goby fish and Quagga Mussels pose serious and imminent threats to the Lake Champlain ecosystem. Both have drastically altered food webs, nutrient cycling, and energy pathways in the Great Lakes and many other lake systems. Researchers will sample inshore and offshore fish and invertebrate communities in each of the five main areas of Lake Champlain to examine the actual and potential resilience of different ecosystems to these invasive species.

## Lake Champlain winter microbial dynamics and long-term data trends

Erin Eggleston, Middlebury College

Increasingly warm and ice-free winter conditions on Lake Champlain suggest that winter microbial dynamics may play more prominent roles in spring and summer phytoplankton and cyanobacteria blooms. These natural phenomena have become more common and problematic for recreation. Researchers will use historical datasets and analyze new water samples throughout the winter in different areas of Lake Champlain to build ecological models to predict and measure spring and summer phytoplankton and cyanobacteria.

