Vermont Water Resources and Lake Studies Center

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

Annual Federal Funds:
$92,335

Annual Non-Federal Funds:
$186,670

Total Annual Funds:
$277,005

www.uvm.edu/rsenr/vtwater

Director and Professor:
Dr. William 'Breck' Bowden
University of Vermont Rubenstein School of Environment and Natural Resources

The Vermont Water Resources and Lake Studies Center (VWRLSC) at the University of Vermont is one of 54 institutes established by Congress through the Water Resources Research Act of 1964. Each of the institutes, located in the nation's land-grant universities, leverage university expertise in research, education, and outreach to find solutions for the water management challenges of concern to each state.

Each year, the VWRLSC funds several research projects, focusing on major issues of concern to the state. Funds support both faculty and graduate student research from any college or university in Vermont. Graduate students are eligible to apply directly for funds, with a faculty supervisor, providing them not only with the opportunity to conduct research, but also to enhance their grant writing skills and learn about project management.

Research priorities for the VWRLSC have typically focused on phosphorus and sediment loading to Lake Champlain. In 2018, five proposals were selected for funding with a diverse range of topics, including acid mine drainage, lake phytoplankton, cyanobacteria, and behavior change to improve water quality. One project is continuing study of streambank erosion. Investigators include three graduate students in the final phases of their research. Faculty researchers from University of Vermont and Middlebury College will also be leading research projects.

2019 Research Projects

Impact of storms on lake phytoplankton community dynamics

Dr. Jason Stockwell, UVM

Storm intensities and frequencies are expected to increase under a changing climate. The impact of wind and rain on primary producer community structure is being explored. During year 2 of the project, researchers will continue to gather data on phytoplankton communities, lake variables, weather, and land use of 41 lakes across the globe, including Lake Champlain. The research is designed to provide a framework for links between storm events, physical structures of lakes, and plankton communities. The research will contribute to the greater understanding of lake phytoplankton diversity and ecosystem resiliency worldwide.

Response and recovery to acidification in Vermont lakes: assessing the sensitivity of acid impaired lakes to increased algae productivity and blooms

M.S. student Sydney Diamond, Dr. Ana M. Morales-Williams, UVM

Following implementation of the Clean Air Act, lakes in the northeast are recovering from decades of acid rain. As lakes recover from acidification, many are experiencing harmful algal blooms as a result of increased nutrient concentrations, while others are “browning” due to dissolved organic carbon.The research will explore the sensitivity of the lake ecosystems to these new threats.

Identifying drivers of change in denitrification capacity of riparian soils during the spring snowmelt/ runoff period PhD Candidate Brittany Lancellotti, Drs. Carol Adair and Julia Perdrial, UVM

Researchers will investigate the role of microorganisms in nitrogen from riparian buffers during the spring runoff period. Nitrogen has often been overlooked when studying nutrient inputs in Lake Champlain; phosphorus gains most attention. However, nitrogen also plays an important role in water quality. Microbial processes in riparian soils transform nitrogen into a less polluting form. These processes are poorly understood. This study will explore how riparian buffers can be used to manage for nitrogen.

Influence of changing lake thermal conditions on coregonine reproductive phenology and larval growth at local to global scales: modeling and experimental approaches

Dr. Jason Stockwell, UVM

Changing lake water temperatures are impacting cold water fish populations, including the socio-economically important whitefish and cisco. The research will be used to help identify sustainable management practices. Models and experiments will be used to understand how warming lake temperatures will impact these fish populations, including reproductivity, larval growth and diet. The data will be globally relevant.