Great Lakes Research Consortium News

Three Western NY Colleges Working on Great Lakes Ecosystem Projects: Invasive Species Detection, Impact of Bloody Red Shrimp, Climate Science

Syracuse, NY. The Great Lakes Research Consortium has announced innovative projects underway by three western New York colleges to help protect and restore the health of the Great Lakes ecosystem. With $40,464 in 2015 New York State Great Lakes Protection Fund dollars, SUNY Buffalo State College, Hobart and William Smith Colleges, and the University of Buffalo are advancing the science associated with early detection of invasive species, the impact of bloody red shrimp on native fish populations, and lake effect storm impact and projection.

The Great Lakes Research Consortium, hosted at the State University of New York College of Environmental Science and Forestry, Syracuse, NY, administers the New York State Great Lakes Protection Fund small grants with support from the New York State Department of Environmental Conservation and New York Great Lakes Basin Advisory Council. Funding for the projects comes from the New York State Great Lakes Protection Fund via the New York State Department of Environmental Conservation.

'This round of small grants project funding is examining the use of innovative and emerging technologies to address ongoing challenges in the unique ecological, environmental, and economic system that is the Great Lakes basin. The results will help communities better deal with invasive species and prepare for lake effect storms, reduce storm-related costs, and better protect this critical environment and resource," said Great Lakes Research Consortium Director Gregory L. Boyer.

The Great Lakes Research Consortium has provided seed funding for the past three years to allow investigators to test new ideas, complete small-scale projects in the Great Lakes basin region, or to start projects to obtain preliminary data that can later be used to request additional funding from larger programs such as the National Science Foundation or the basin-wide Great Lakes Protection Fund.

Applications for the 2016 round of funding are due January 9, 2016; the request for proposals is posted at www.esf.edu/glrc.

The projects receiving 2015 funds are as follows:

1. SUNY Buffalo State College: $12,464.00 for a proof-of-concept pilot project evaluating the use and accuracy of low-altitude, high-definition aerial imaging for rapid detection and extent estimation of invasive species. Rapid detection of invasive species can mobilize control measures early and greatly reduce management costs.

Project leader Dr. Tao Tang, a professor of geography and planning, and his team are testing are testing the use of low-altitude unmanned vehicle technology to detect, gauge and monitor the extent of the aquatic invasive species water chestnut in Tonawanda Creek and in the Erie Canal system as far west as Rochester, NY. The accuracy of the aerial data will be compared with data collected by boat. Sightings and invasive species coverage estimate data will be uploaded into iMapInvasives, an internet-based invasive species distribution database.

Project partners include the Western NY Partnership for Regional Invasive Species Management and Buffalo/Niagara Riverkeeper.

2. Hobart and William Smith Colleges: $14,000.00 to develop new methods for early detection of non-native blood red shrimp in the Great Lakes basin in New York and to quantify how the invasive species interacts with fish populations.

Project leader Dr. Meghan Brown, an associate professor and Biology Department Chair, and her research team are evaluating a proposed trapping system and the analysis of environmental DNA to more easily and reliably detect the invasive species bloody red mysid, or *Hemimysis anomala*, that poses a potential threat to native species in the Great Lakes basin.

The research team is also evaluating how naturalized fish species that are economically and ecologically important interact with *Hemimysis* as a food source.

This research will improve early detection of *Hemimysis* and provide insight on the currently unclear impact that *Hemimysis* will have on fish populations in NY waters. This invasive species could represent a competitor or an important food source for young sport fish such as lake trout, walleye, smallmouth bass, and largemouth bass or for the prey fish that support these and other sport fish.

Project partners include Ithaca College, Poughkeepsie Day School, and the Finger Lakes Institute at Hobart and William Smith Colleges.

3. SUNY at Buffalo: $14,000.00 to explore whether water isotopes can be used to reconstruct rain and lake effect snowfall during past warm climates.

Project leader Dr. Elizabeth K. Thomas, an assistant professor and research assistant professor, Department of Geology, and her team have proposed to develop a means for

reconstructing lake effect snow and rain events during past warmer-than-now years in the Great Lakes region as a baseline for improving models projecting future climate change impacts in the region.

Dr. Thomas and her team are using the hydrogen isotopes of leaf waxes, the protective coating produced by all plants using hydrogen from precipitation; this method has proven useful for reconstructing past precipitation seasonality in the tropics but has not yet been applied to reconstruct precipitation seasonality in temperature climate regions.

Improving predictions of seasonal precipitation and the impact on Great Lakes water resources is critical to ecological resilience and economic security in the region. Improved prediction models will help communities better prepare for lake effect storms and reduce costs associated with those storms. For example, the Associated Press reported that the lake effect snowstorm of November 2015 caused more than $46 million in damage across nine counties in New York state.

Beaver Meadow Audubon Center, North Java, NY, in the Lake Erie lake effect snowbelt is the research location.

The Great Lakes Research Consortium is an organization of 18 colleges and universities in New York State with nine affiliate campuses in Ontario, Canada, dedicated to collaborative Great Lakes research and science education. Learn more at www.esf.edu/glrc/.

MORE INFO:
The NY colleges and universities participating in the Great Lakes Research Consortium include:
Binghamton University, Buffalo State College, Clarkson University, Cornell University, Hobart and William Smith Colleges, Rochester Institute of Technology, St. Lawrence University, SUNY Brockport, SUNY Cortland, SUNY Fredonia, SUNY Geneseo, SUNY Oswego, SUNY Plattsburgh, SUNY Potsdam, SUNY College of Environmental Science and Forestry, Syracuse University, the University at Albany, and the University at Buffalo.

The Canadian affiliate colleges of the GLRC include:
Brock University, McMaster University, Queen's University, Ryerson University, University of Guelph, University of Ottawa, University of Toronto, University of Waterloo, and University of Windsor.

The Great Lakes Basin Advisory Council is a statutory body that was created in 1988 to assist New York State in its efforts to protect the environmental, social and economic health of the Great Lakes region. The Council advises the Governor and NYSDEC Commissioner regarding New York's role in regional, federal, and international water quality issues, and functions as a link between the government and the public.