WATER CENTER
UNIVERSITY OF MICHIGAN

Increasing Freshwater Research Capacity at the University of Michigan:
A Rolling Request for Proposals (August 2013-January 2014)

Between August 2013 and January 2014 the Water Center solicited proposals to increase freshwater research capacity at the University of Michigan.

Through this RFP, the Center engaged diverse University of Michigan faculty and researchers to address critical freshwater issues globally and expand freshwater research and teaching on campus. A primary goal of the initiative is to support projects that address key freshwater challenges at the interface of the natural, social, physical, and health sciences.

We challenged the U-M community to cross departmental and disciplinary boundaries to assemble teams best-equipped to address the most complex issues facing freshwater ecosystems, and the response was tremendous. Through a rigorous review process, that engaged external technical reviewers and past and present Associate Vice Presidents for Research, we were able to identify those projects most capable of harnessing the diverse research excellence on campus and applying it to freshwater systems in novel and needed ways.

Fourteen projects of 49 submitted were selected for funding, totaling more than $1.2 million in grants to increase freshwater research capacity at the University.

The RFP offered two levels of funding: leveraging grants, up to $50,000, to develop curriculum, support instrument acquisition, or support graduate students and fellows; and grants up to $250,000 for larger, cross-departmental efforts that cultivate new research partnerships and capabilities as the basis for long-term freshwater research efforts at the University.

The fourteen grants and their investigators are listed below. Detailed descriptions of these projects are available at http://graham.umich.edu/water/projects.

LARGE GRANTS (UP TO $250,000)

Building capacity for freshwater science: Integrating microbial genomics, environmental chemistry, and ecosystem processes to understand harmful algal blooms

Investigators:

Gregory Dick, University of Michigan, Department of Earth and Environmental Sciences and Biology, Department of Ecology and Evolutionary Biology

Thomas Johengen, University of Michigan, Cooperative Institute for Limnology and Ecosystems Research

Vincent Denef, University of Michigan, Department of Ecology and Evolutionary Biology

Goal: Integrate methods and add perspectives from diverse disciplines to build capacity for understanding the causes and consequences of harmful algal blooms

Microplastics in the Great Lakes: Towards establishing a long-term multidisciplinary research platform to assess the impact of microplastics on Laurentian Great Lakes ecosystem health

Investigators:

Melissa Duhaime, University of Michigan, Ecology and Evolutionary Biology

Krista Rule Wigginton, University of Michigan, Civil and Environmental Engineering

Dmitry Beletsky, University of Michigan, Cooperative Institute for Limnology and Ecosystems Research

Goal: Establish a research program on campus to study the ecological and environmental health risks of microplastic debris in the Great Lakes

Improving water quality and well-being in Great Lakes post-industrial cities: A multidisciplinary partnership to assess Detroit's green infrastructure

Investigators:

Joan Nassauer, University of Michigan, School of Natural Resources and Environment

Natalie Sampson, University of Michigan, School of Public Health

Goal: Establish a multidisciplinary research team to explore the implications of green infrastructure design and planning strategies on socio-environmental systems in Detroit

LEVERAGING GRANTS (UP TO $50,000)

Lake spray aerosol emissions of toxins and pollutants to the atmosphere in the Great Lakes Region
Investigators:
Andrew Ault, University of Michigan, Department of Environmental Health Sciences
Kerri Pratt, University of Michigan, Department of Chemistry
Goal: Establish the capability at U-M to study freshwater lake spray particles to inform future studies exploring potential human health impacts

Advancing student learning in freshwater science: curriculum development and research experiences for undergraduates in aquatic geochemistry.
Investigator:
Rose Cory, University of Michigan, Earth and Environmental Sciences
Goal: Enhance learning and research experiences for undergraduates studying aquatic geochemistry

Stream Restoration for Graduates: Enhancing multidisciplinary learning through course augmentation and in-stream experiential activities
Investigators:
Aline Cotel, University of Michigan, Department of Civil and Environmental Engineering
Catherine Riseng, University of Michigan, School of Natural Resources and Environment
Goal: Improve a graduate-level stream restoration course in order to attract students from diverse departments and increase hands-on learning

Environmental DNA-based quantification of dreissenid mussels and their impacts on freshwater bacterioplankton: Building the foundation for a U-M program focused on the interactions between freshwater invasive species and microbial communities
***Investigators*:**
Vincent Denef, University of Michigan, Department of Ecology and Evolutionary Biology
Thomas Johengen, University of Michigan, Cooperative Institute for Limnology and Ecosystems Research
Goal: Establish an assay using environmental DNA to assess zebra mussel abundance and its impacts on microbial communities in inland lakes

Assessing the assessment tool: Developing improved modeling frameworks for evaluating hydraulic fracturing water withdrawals in Michigan
Investigators:
Brian Ellis, University of Michigan, Department of Civil and Environmental Engineering
Avery Demond, University of Michigan, Department of Civil and Environmental Engineering
Goal: Assess the adequacy of an online screening tool to evaluate the impacts of hydraulic fracturing-related water withdrawals on surface water and residential water supply wells

Identifying the environmental controls of algal pathogen epidemics and their influence on harmful algal blooms in Lake Erie

Investigators:

Timothy James, University of Michigan, Ecology and Evolutionary Biology
Gary Fahnenstiel, University of Michigan, Water Center
John Marino, University of Michigan, Ecology and Evolutionary Biology

Goal: Better understand the role of algal pathogens in regulating harmful algal blooms in Lake Erie

Stuck in the Muck: Comparing how experts and local communities see beach muck in the Great Lakes

Investigators:

Rachel Kaplan, University of Michigan, School of Natural Resources and Environment
Avik Basu, University of Michigan, School of Natural Resources and Environment
Jason Duvall, University of Michigan, Program in the Environment
Donna Kashian, Wayne State University, Biological Sciences

Goal: Improve efforts to resolve beach "muck" (shore deposits of benthic algae) issues in Saginaw Bay by investigating public and expert perceptions of the problem

A new sensor platform for the measurement of evaporation across the Great Lakes

Investigators:

Branko Kerkez, University of Michigan, Civil and Environmental Engineering
Andrew Gronewald, University of Michigan, Civil and Environmental Engineering, NOAA GLERL

Goal: Improve measurements of overlake evaporation through the development of a new sensor platform

Exploring empirical evidence for climate justice in the Huron River Watershed

Investigators:

Paul Mohai, University of Michigan, School of Natural Resources and Environment
Chingwen Cheng, University of Michigan, School of Natural Resources and Environment
Margaret Kalcic, University of Michigan, Graham Sustainability Institute

Goal: Conduct an empirical study of climate justice for the Huron River watershed including developing an index that reflects socioeconomic impacts of climate change

The impacts of agriculture on freshwater ecosystems: Will strengthening local food systems help or hurt?

Investigators:

Ethan Schoolman, University of Michigan, School of Natural Resources and Environment
Thomas Princen, University of Michigan, School of Natural Resources and Environment
Margaret Kalcic, University of Michigan, Graham Sustainability Institute

Goal: Investigate the environmental consequences of efforts to strengthen local food systems

High Resolution Orbitrap Mass Spectrometry for Expanding U-M Freshwater Research

Investigators:
Krista Rule Wigginton, University of Michigan, Civil and Environmental Engineering
Nancy Love, University of Michigan, Civil and Environmental Engineering
Allen Burton, University of Michigan, School of Natural Resources and Environment, CILER
Terese Olson, University of Michigan, Civil and Environmental Engineering

Goal: Improve the ability to detect, quantify and classify previously unidentified organic contaminants present in freshwater systems through the purchase of an obitrap mass spectrometer