

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

The Water Center is working to enhance freshwater research activities at the University of Michigan by fostering cross-disciplinary collaborations, encouraging new linkages to freshwater issues in research and courses, and providing more opportunities to study and learn about the Great Lakes and other large freshwater systems.

Through this funding effort, the Water Center is increasing U-M's capacity to contribute solutions to the protection and restoration of freshwater systems.

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PROJECT SUMMARY

Harmful algal blooms (HABs) are a global threat to freshwater ecosystems, water resources, and human health. The interplay of microbial, ecological, and chemical processes causes toxin production, formation of lake "dead zones", and proliferation of disease-causing organisms. Further, a confluence of factors spanning multiple disciplines such as agricultural practices, climate change, and hydrologic conditions have set the stage for increasing the frequency, duration, and toxicity of HABs.

This project will contribute solutions to this problem by integrating new approaches to a local natural laboratory, Lake Erie, which experienced the largest HAB in recorded history in 2011. The project assembles a world-class research team to integrate methods and add perspectives from diverse disciplines, building a unique capacity for understanding the causes and consequences of HABs. This approach complements and extends existing freshwater capabilities in climate and hydrology at both U-M and a local federal partner, NOAA-GLERL.

The project will increase the breadth and depth of freshwater research at U-M by creating a team of 11 researchers from 5 U-M units and a federal agency, bringing cutting-edge genomics and chemistry and adding entirely new dimensions while building upon existing strengths and programs. Project results will be synthesized and disseminated with a publicly available database, and a capstone symposium to highlight findings and launch new initiatives. Together with recently funded and proposed projects, this novel approach will poise U-M to be a leader in HABs and related freshwater research and open new avenues for external funding.



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