GREAT LAKES CENTER FOR FRESH WATERS AND HUMAN HEALTH

$5.2 MILLION GRANT FROM NIEHS AND NSF WILL FUND GREAT LAKES CENTER FOR FRESH WATERS AND HUMAN HEALTH

Bowling Green State University has received a $5.2 million grant to establish the Great Lakes Center for Fresh Waters and Human Health.

The five-year grant awarded by the National Institute of Environmental Health Sciences and the National Science Foundation will be administered by BGSU. The Center is a collaborative effort with eight other universities and research institutions that will greatly expand the scientific capacity to investigate cyanobacterial harmful algal blooms (cHABs). BGSU researchers at the Center will focus on how environmental factors promote or constrain cHAB species, what factors influence toxin production, and how other microbes influence cHAB growth and toxicity.

The goal is to develop the ability to accurately predict the onset and toxicity of cHABs and provide lake resource managers with timely information on how to mitigate blooms. And while the Center's work will focus on Lake Erie, this research will have global implications as other nations also grapple with the growing problem of cHABs.

The Center, under the direction of Professor George Bullerjahn, will help formalize and energize institutional relationships that have existed for many years. Along with BGSU, participants include:

- National Oceanic and Atmospheric Administration
- Ohio Sea Grant
- The Ohio State University
- SUNY – College of Environmental Science and Forestry
- University of Michigan
- Michigan State University
- University of North Carolina
- University of Tennessee
- University of Toledo

In addition to expanding research efforts, the Center will also emphasize community engagement by sharing the impacts of cHABs with the public and Great Lakes stakeholders. This will include training scientists and others associated with the Center on effective outreach and communication methods. Researchers will also work with charter boat captains to develop a near real-time database on cHAB severity in Lake Erie and will coordinate sampling with the U.S. Coast Guard and its ice-breaking assets to assess the expanse of winter blooms implicated in central basin hypoxia, the so-called Lake Erie 'dead zone.'

What are cyanobacteria?

Cyanobacteria are a group of single-celled aquatic organisms that have been around for a very, very long time – billions of years. They are photosynthetic, drawing energy from sunlight, and some species play an important role in the environment by converting atmospheric nitrogen into chemical forms that plants require to grow. Collectively, they also produce about 25% of the oxygen in the atmosphere.

Under the right conditions, however, cyanobacteria can reproduce massively – yielding a bloom. Many factors can contribute to the severity of a bloom, but they typically result from excess nutrients in the water, specifically phosphorus and nitrogen, and warmer water temperatures, which most freshwater cyanobacteria favor.

When they occur, blooms can turn freshwater into "pea soup" and create thick mats of slime on the surface of the water and along the shoreline. Blooms can also smother bottom-dwelling aquatic plant life and when they die and degrade they can lead to fish die-offs due to lack of oxygen in the water. Some species of cyanobacteria also produce toxins that can be harmful to pets, livestock, wildlife and humans. For example, the 2014 Toledo water crisis was the result of cHAB toxins from western Lake Erie contaminating the city's water supply.

The Center's Mission

As a public university, BGSU is committed to serving the public good through research that addresses the issues facing our state, our country and the world. The Lake Erie Center is a collaborative, multi-disciplinary center of researchers with a common purpose:

- Studying how environmental factors promote or limit harmful cyanobacterial algal blooms
- Creating the data systems and tools needed to better predict and limit harmful cyanobacterial algal blooms
- Serving as a resource, sharing the impacts of algal blooms with communities and stakeholders of Lake Erie and its watersheds
- Training scientists and contributing to global efforts to understand and mitigate harmful algal blooms

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AT BOWLING GREEN STATE UNIVERSITY

BGSU.