

Identifying factors that affect toxicity in Lake Erie's harmful algal blooms



CORE QUESTION:

What factors make some harmful algal blooms more toxic than others?

A TOXIC PROBLEM

By now, Lake Erie's harmful algal blooms are an annual fixture. These population explosions of the blue-green algae *Microcystis aeruginosa* can produce a toxin called microcystin that threatens ecosystem health and drinking water supplies. Harmful algal blooms also appear in Lake St. Clair, Green Bay, Saginaw Bay, and inland lakes around the world.

Researchers have identified many factors that influence the distribution and timing of Lake Erie's algal blooms. However, the factors affecting how much toxic microcystin the blooming algae produce remain less clear.

BRINGING THE LAKE TO THE LAB

Gregory Dick, an associate professor at the University of Michigan, will develop models to help determine why some strains of harmful algal blooms are more toxic to humans and animals than others.

Microcystis strains that thrive in the early stages of a bloom tend to produce more microcystin than strains that dominate later in the season. Dick's research team will expose multiple strains of Lake Erie algae to conditions that typically fluctuate during a bloom season, such as

light, temperature, and nitrogen availability. The resulting microcystin levels will inform computer models of bloom toxicity. The team will compare their model predictions to experimental observations and field data from past blooms to fine-tune the model parameters.

Their results could help develop early-warning systems that forecast bloom toxicity, an invaluable tool for drinking water suppliers, recreational industries, anglers, shoreline residents, and other groups affected by Lake Erie's annual blooms.

Videos, photographs, and other materials generated during the study will also be integrated into a University of Michigan Earth science course, inspiring a new generation of potential Great Lakes researchers and stewards.

CONTACT

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