

Getting a grip on nuisance algae Professor's findings may point to solutions

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People who live and play on area lakes are beginning to brace themselves for the return of green slime.

With rising temperatures and dropping lake levels come thick mats of algae that fill ponds, lakes and the quieter stretches of the Huron River. The algae blooms and their resulting odor are a nuisance to canoeists and fishermen, a threat to fish and an unwelcome guest at many lakeside barbecues.

But a University of Michigan professor researching the problem along the Huron River, especially Ford and Belleville lakes, has findings that may already point to potential solutions.

John Lehman, professor of ecology and evolutionary biology, became interested in the problem after serving on the board of the Huron River Watershed Council several years ago. He knew the algae issue wasn't getting better, despite efforts to reduce nutrients believed to cause them.

Conventional wisdom has for years held that phosphorus was the primary nutrient responsible for algae growth. It comes from waste and from products such as dishwashing liquid and detergents, though in much lower concentrations than in the decades past.

As nuisance algae became more common, the Michigan Department of Environmental Quality monitored and regulated phosphorus coming in from wastewater treatment plants. The amount of phosphorus removed was reaching the point by which it was virtually impossible to remove any more, Lehman said, but there was little improvement in summertime algae blooms.

That's because it's more complicated than just how much phosphorus is going into the water, Lehman said. Problem algae has to do with what kinds, not just how much. And what kinds of algae exist are influenced not just by phosphorus but by the phosphorus-to-nitrogen ratio.

Many types of algae are beneficial - they allow fish to eat and thrive. But cyanobacteria, or blue-green algae, is a problem.

"They tend to accumulate in large quantities, and because they have little gas bubbles inside their cells, they sometimes all float up to the surface," Lehman said. "Then the wind pushes them onto shore, they decompose in the sun, and that's the really obnoxious situation."

According to the federal Centers for Disease Control and Prevention, cyanobacteria produce toxins that are believed to cause gastroenteritis, respiratory problems, skin irritation, allergic responses, and liver damage in people exposed to large amounts.

Lehman and his research team, funded by the U.S. Environmental Protection Agency, are monitoring weather conditions and measuring nutrients and metals in the lakes and the river.

So far, he's discovered that nitrate concentrations in Ford Lake drop precipitously in summer. High quantities of nitrate encourage good algae - the kind that doesn't form huge clots of green slime. Low concentrations create the perfect environment for cyanobacteria.

"It turns out they have a huge competitive advantage," he said.

Weather and lake management practices exacerbate the problem. During dry summers, dam operators upstream open gates at the top of the lakes, allowing bottom water to stagnate, releasing phosphorus and ammonia from the muddy floor. Cyanobacteria can draw the nitrogen it needs from ammonia. When a storm comes through, the lake is churned up and undesirable algae take over the upper layers of the lake as well.

Lehman said strategies for preventing the blooms would include preventing those lower layers of water from ever forming. A solution might be to use baffles at dams that would pull water up from lower layers before running it through the dam.

But implementing those solutions are up to people who live along the lakes, he said. "It ultimately comes down to citizens and their decision making-ability," he said.

Livingston County Drain Commissioner Brian Jonckheere said baffles are frequently used in big dams to regulate temperature to control fish populations, or to oxygenate lower layers of the lake. The Huron has a number of dams on it through the county, many operated by different entities including road commissions, the county, the metroparks and others, he said.

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