Wanted: Innovative farmers to help slow algal bloom on Lake Erie

Why We Wrote This

Recurring problems can sometimes feel inevitable. In Ohio, a growing number of farmers are breaking from industry norms to combat an annual scourge on Lake Erie.

Paul Sancya/AP
Algae floats in the water at the Maumee Bay State Park marina in Lake Erie in Oregon, Ohio, Sept. 15, 2017. On March 22, the Ohio Environmental Protection Agency, under pressure from environmental groups, put western Lake Erie on a list of 'impaired' bodies of water.

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- By Richard Mertens Correspondent

As summer approaches, researchers have their eye on Lake Erie, where summer blooms of toxic algae, known as cyanobacteria, have been taking a toll on the local economy and raising public health concerns for at least 15 years. Forecasters started watching the lake and its tributaries this month as they work to estimate how extensive this year's problem may become. Scientists have tied the annual algal bloom to runoff of nutrients from surrounding agricultural operations. The Environmental Protection Agency considers nutrient pollution one of the biggest threats to water quality in the United States, and it’s a growing problem worldwide. In Ohio, a lot is being done to address the annual blooms. Scientists are learning more about soil chemistry, farming practices, and nutrient pollution. More farmers are adopting environmentally friendly methods, often with financial help from the federal government. New laws are regulating when livestock farmers can spread manure on their fields. But so far the problem is outstripping efforts. As farmers become attuned to the problem, more of them are taking ownership of their role in both the problem and the solution.

McComb, Ohio

Flat, mosquito infested, and barely passable, the Great Black Swamp once covered 1,500 square miles of northwestern Ohio and neighboring Indiana. Drained and settled in the 19th century, the area includes the farm that Duane Stateler’s great-grandfather started back then. Today, Mr. Stateler and his son raise hogs and grow corn, soybeans, and wheat on the family’s acreage. But for the sake of Lake Erie, he’s giving a small part of it back to the swamp.

The old Black Swamp used to hold back and clean the water that flowed into Lake Erie, which forecasters started watching this month to predict how bad the summer’s harmful algal blooms will be. Stateler’s six muddy acres gone to marsh is a small part of of one farmer’s attempt to help minimize the unwanted growth that turns western Lake Erie green, a condition for which agricultural nutrients are largely to blame.

Farmers are facing mounting pressure to keep nutrients on their land and out of the lake. Toxic algae—cyanobacteria—has been getting worse since at least 2003, hurting the local economy and raising public health concerns. On March 22, the Ohio Environmental Protection Agency, under pressure from environmental groups, put western Lake Erie on a list

of "impaired" bodies of water, a designation that could lead to stricter water quality standards and tougher regulations on agriculture.

"I think the success so far is the recognition across pretty much all the stakeholders that what's going on now is a problem and that something needs to be done to fix it," says Madeline Fleisher, a lawyer with the Chicago-based Environmental Law and Policy Center. "The disagreement is over what needs to be done."

A lot is being done already. Scientists are learning more about soil chemistry, farming practices, and nutrient pollution. More farmers are adopting environmentally friendly methods, often with financial help from the federal government. New laws are regulating when livestock farmers can and can't spread manure on their fields – not on frozen ground or before heavy rain.

Despite furor, accountability lags for police. Here's why it might change.

But so far the problem is outstripping efforts. Algal blooms keep reaching record proportions. Agricultural nutrients in the Maumee River, Lake Erie's biggest source of pollution, are undiminished. Research suggests that most nutrient pollution is caused by big storms like the eight-inch rainfall that lashed the Stateler farm last July, and with climate change these storms are becoming more common.

A local problem with international reach

An international commission representing the Great Lakes states and two Canadian provinces wants to reduce phosphorous, the main nutrient behind the algal blooms, by 40 percent. Scientists say this goal is within reach – but only if a lot more farmers take part. "We need to have farmers participating at a scale that's unprecedented," says Don Scavia, a professor emeritus of environment and sustainability at the University of Michigan.

The EPA considers nutrient pollution one of the biggest threats to water quality in the United States, and it's a growing problem worldwide. It afflicts big estuaries and marine ecosystems, but also many smaller bodies of water across the country – more than 2.5 million acres, according to one EPA estimate.

Richard Mertens
Duane Stateler, a farmer near McComb, Ohio, and a participant in the Blanchard River Demonstration Farms Network shows off equipment measuring how much nutrient is coming off his field, both on the surface and in drainage tiles underneath.

For Lake Erie the problem is both new and old. In the 1960s and '70s, the lake was notorious for its foul-smelling water. The 1972 Great Lakes Water Quality Agreement between the US and Canada began to change that. A crackdown on industries and upgrades to sewage treatment plants helped bring about dramatic improvement. The 1972 Clean Water Act had a similar effect across the US. But agriculture and other "non-point" pollution sources remained unregulated.

Stateler's 1,000 acres near the village of McComb dwarfs his great-grandfather Samuel's 240 acres at the edge of the Black Swamp, where he felled trees and made crude wooden pipes to drain the wet soil. Drainage systems like these, later made of clay and PVC, underlie much of northwestern Ohio. They have made agriculture possible but hastened the flow of nutrients off the land.

Stateler has adopted many strategies to reduce runoff, some costly and time-consuming: grassy strips along waterways and controls on his drainage systems; extensive soil tests so he knows how much nutrient a patch of field needs. He plants cover crops to protect the soil over the winter, and he doesn't spread manure over the ground but injects it – one of the most important things a farmer can do, researchers say.

Two years ago Stateler joined the Blanchard River Demonstration Farms Network, an initiative of the US Department of Agriculture and the Ohio Farm Bureau. Nearly 500 farmers, public officials, community leaders, and graduate

students came last year to see how farmers can reduce agricultural pollution. Many "had no idea what we were doing," Stateler says.

The number of outreach efforts is growing. The fertilizer industry and the Nature Conservancy, a farmer-friendly environmental group, started a voluntary certification program to encourage more careful fertilizer use. Fishing boat captains are taking farmers out on Lake Erie to let them see algal blooms first-hand. "Their reaction is 'Wow' … 'I didn't understand it was as bad as it really is,' " says Dave Spangler, vice president of the Lake Erie Charter Boat Association. The association says algal blooms have hurt business by as much as 30 percent.

Efforts like these may be having an effect. People who work with farmers detect a growing acceptance that agriculture is at least partly to blame for Lake Erie's woes. "They're very concerned and want to do something," says Robyn Wilson, a researcher at Ohio State University. "But they're not convinced that the recommendations are feasible at the farm level, or that if enough farmers did it, it would solve the problem. So we're kind of falling flat on the last piece of the puzzle."

Are voluntary measures enough?

The USDA says farmers are making "significant headway" toward reducing nutrient pollution, but many researchers say that voluntary actions aren't enough. A recent report urges more outreach and better targeting of conservation dollars, but also mandated soil testing. "If we could get everybody to do soil tests regularly and follow the tests, we'd go a long way toward solving the problem," says Jeffrey Reutter, one of the authors and former head of Ohio Sea Grant.

Meanwhile, wetland restoration – bringing back bits of the Black Swamp—is getting more attention. Beyond the Stateler's new little wetland, the Black Swamp Conservancy is working on turning 60 acres back into swamp, among its other projects that protect natural and agricultural lands in northwestern Ohio. William Mitsch, a retired Ohio State University professor and wetlands expert, envisions something bigger. He says that restoring a tenth of the Black Swamp – about 100,000 acres – would be enough to clean Lake Erie.

The idea isn't as far-fetched as it sounds, he says. Constructed wetlands in south Florida are cleaning water from sugarcane fields before it reaches the Everglades. Dr. Mitsch's idea is to build temporary wetlands that can be flipped back to fields, with crops feeding on nutrients the wetlands have trapped.

He's begun to test this idea in northwestern Ohio. At the corner of an empty field, Mitsch and a crew have sunk 28 plastic tubs into the ground. Nutrient-rich water from a drainage ditch will be pumped to the tubs. Planted with cattails, each tub, or "mesocosm," as Mitsch calls them, will become a small wetland.

Soon dirty water is gurgling through the pipes. Mitsch and his colleagues want to know how many years these mini-wetlands can absorb nutrients, and how well they can nurture crops afterward. "I'm sympathetic to farmers," Mitsch says, gazing across the barren countryside. "But I'd like to see it in wetlands on a bigger scale. Bring back the Black Swamp! Bring back the Everglades! It's not enough to say, 'Let's mitigate an acre here, an acre there.' That's not going to do it."

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