Illinois falls behind federal goal to reduce phosphorus and nitrogen flowing into its waterways

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Hundreds of miles south of Chicago, decomposing algae in the Gulf of Mexico makes life so perilous for fish they swim away—or die.

These dead zones, which result from algae blooms sapping up oxygen, have increased in oceans around the world as waters warm.

Illinois is among the top feeders to the Gulf of Mexico dead zone, as nutrients from sewage treatment plants, and farm fertilizer and manure, eventually flow into the Mississippi River.

The state is not only missing benchmarks to reduce nutrients, the problem is growing. This doesn't bode well for a goal created by a federal task force to reduce the dead zone's five-year average size by thousands of square miles.

While sewage treatment plants have reduced their contributions through permit limits, addressing pollution on farms largely depends on voluntary efforts. Agriculture accounts for the majority of the nutrients.

How to encourage farming conservation practices is up for debate—with possibilities including more regulation, more incentives, more funding and even a nutrient trading system—as climate change threatens more intense storms capable of sending more nutrients into water through erosion and runoff.

Lee Curby farms corn and soybeans south of Springfield and uses practices including cover crops to reduce nutrient loss. Conservation has long been on his radar because the Lake Springfield reservoir—which provides drinking water for residents—has suffered from nutrient pollution.

Curby said he worries that if the industry doesn't start to move in the right direction, "somebody's going to tell you what to do." And, he said, "It's easier to do it the right way without regulation than it is to be regulated."

The lack of progress in a decade should raise "some serious red flags," Curby said.

"I think there have been some pretty big moves over the past 10 years that should have made a difference," he said. "And why are we not seeing that in the end result?"

'A wake-up call'

In the last five years, the Gulf of Mexico dead zone has averaged 5,380 square miles, with the largest on record, in 2017, covering 8,776 square miles—about the size of New Jersey.

This season, the dead zone covered about 6,334 square miles, according to the National Oceanic and Atmospheric Administration.

A task force with representatives from federal and state agencies and tribal entities created an action plan two decades ago to reduce the dead zone. Subsequently, states in the Mississippi basin, including Illinois, formulated individual plans to reduce nutrients.

Illinois sends the most phosphorus to the Gulf, and is the second largest contributor of nitrogen, according to U.S. Geological Survey modeling. Fertilizer is the largest source.

Along with the dead zone, nutrients can fuel harmful algae blooms, which are a recurring problem in Illinois waters.

By 2025, Illinois aims to reduce nitrogen and nitrate by 15% and phosphorus by 25%, with a goal of greater long-term reductions.

Instead, averaged from 2015 to 2019, nitrogen loads increased by 13% compared with a baseline period from 1980 to 1996, and phosphorus

loads increased by 35%, according to the latest biennial report on the state's reduction strategy, released this fall.

"This report, and even the previous report from a couple years ago, should be a wake-up call that the status quo of what the state agencies have been doing around nutrient loss is not working," said Eliot Clay, agriculture and water programs director for the Illinois Environmental Council.

Some progress has been made on nutrient loads from sewage treatment plants, and more plants will be under permit requirements in the coming years, which is expected to lead to further reductions. That includes some of the largest dischargers operated by the Metropolitan Water Reclamation District, the taxpayer-funded agency that handles the waste of Chicago and the Cook County suburbs.

Through the Clean Water Act, point source pollution, which generally comes from an identifiable place such as a discharge pipe, can be regulated. More than a third of major municipal wastewater facilities in Illinois have permits that limit phosphorus discharge.

But improvements can come with significant costs—which may fall on ratepayers.

"It's pretty much the same news as it is every two years," Clay said, referencing the latest report. "Essentially that we've made a lot of progress on what they call point source pollution, which is definitely good, but the nonpoint source side for primarily agriculture and stormwater runoff and that kind of thing, we have not made any progress. And in fact it's getting worse."

Aside from 14 of the 536 identified CAFOs—or concentrated animal feeding operations that are capable of producing massive amounts of

waste —agriculture is generally considered a nonpoint source, and excluded from the permit system.

Farmland covers three-quarters of the state and more than a third of cropland has subsurface drainage to reduce excess water, which can assist in nutrient transport.

The nutrient problem is eventually going to have to be dealt with, said Catie Gregg, an agriculture program specialist with the Prairie Rivers Network.

"And it's really just a question of, what are the costs that we're going to accumulate in the meantime."

'A learning curve'

"We're trying to solve a problem in 10 years or 20 years that's something that's been going on for decades," said Trevor Sample, the Illinois EPA coordinator for the state's strategy.

The latest report includes scenarios that could lead to reductions, but the scale and pace of conservation efforts needs to increase. Cover crops, tilling practices that cause less soil disturbance and buffers that absorb nutrients are among the recommended practices, along with fertilizer guidelines that result in the least amount washed away.

Dozens of programs from state and federal agencies, and nongovernment organizations, are designed to help farmers, and include grant funding and cost-share programs.

But it can be a big ask to make investments that may not show immediate benefits, Sample said. Many Illinois farmers rent land. Additionally, in the most recent survey conducted about the Illinois

strategy, about a quarter of farmers said they didn't know anything about it.

"There's a lot of barriers to implementing some of these practices," Sample said. "And there's a learning curve. And there's risk factors to their crops and even their livelihoods."

So, Sample said, "They start small and see how it works on their field and they go from there."

Not all waterways saw nutrient spikes, and some saw reductions, signaling that complicated factors including residual nutrients built up over years may be at play. But heavy rains may also be hiding some improvements.

The wettest 12 months on record for the country came from July 2018 through June 2019; Illinois saw severe flooding. Statewide river flow from 2015 to 2019 was 25% above the baseline period, according to the fall report, which increased nutrient loads.

Looking ahead, the extremes of 2019 may not be such an outlier. This year, a natural disaster designation was issued for 12 counties where farmers faced flash flooding in the spring and summer. Farmers in three counties were included in another declaration for a May freeze.

Curby, the central Illinois farmer, has noticed the shift.

"It seems like it doesn't rain," Curby said. "And then all of a sudden, it comes all at once."

There's also climbing temperatures.

"Today's a perfect example," Curby said. "It's 60 degrees in December."

Shifting conditions affect farm operations, as the window to accomplish work seems smaller all the time, Curby said. Climate change may require reevaluating the playbook.

"You can't just do it the same way dad did it," he said. "You've got to be willing to change."

'No singular fix'

The historic flooding in 2019 presented significant challenges for farmers, said Lauren Lurkins, director of environmental policy with the Illinois Farm Bureau.

"We knew this was going to be A) a long-term effort, and B) we were looking at long-term trends," Lurkins said. "So we were not going to judge progress on the tick up and tick down."

Rather than regulation, more awareness of cost-share opportunities and funding for conservation programs is needed to address the problem, Lurkins said, with more "demand in the state than we have the money to go around."

Others have advocated for a system of "carrots and sticks" to see results.

"You have some incentive to do this particular good thing and there's an equally strong disincentive to not do the bad thing," said Jeff Reutter, former director of the Ohio Sea Grant and Ohio State Stone Lab, who studied the lack of progress to reduce nutrients in Ohio as Lake Erie's algae problem grew. "We don't have any disincentives right now. We have only incentives."

In Illinois, one approach being considered is nutrient trading.

The Illinois Nutrient Trading Initiative began in 2018, led by the nonprofit Current, the University of Chicago's Abrams Environmental Law Clinic and Gerald Keenan, former chairman of the Illinois Pollution Control Board.

Proponents of the market-based approach argue it offers more flexibility in meeting requirements. Credits could be generated by sewage treatment plants overcomplying or farms implementing best practices beyond a baseline. Small scale attempts are underway in neighboring states, including Iowa.

"We find ourselves facing a conundrum—lower-cost nutrient reductions are achievable, but agricultural sources that could provide those reductions have few incentives and insufficient capital to do so," said a conveners report on the initiative, released this month. "At the same time, there is opportunity, as farmers are urgently searching for means to diversify their revenue streams and weather financial challenges."

"This report in my mind is designed to be a catalyst," said Mark Templeton, director of the Abrams Environmental Law Clinic.

Designing a trading program could involve significant challenges, including verifying farm reductions and keeping an eye on pollution hot spots that might emerge.

But it would not be about regulating the agricultural sector more broadly, Templeton said.

"This is about additional carrots, additional incentives, additional opportunities for agricultural producers to make money and have the environmental benefits as well," Templeton said.

States shared updates on their reduction strategies recently at a task force

meeting. To some, the path forward seems likely to take a variety of tools.

Gail Hesse, Great Lakes water program director for the National Wildlife Federation, worked on water programs for decades with the Ohio EPA. Farms vary widely, Hesse said, and when it comes to regulation, "I think how that question gets answered will be different for every state."

"The reality is, there's no singular fix."

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