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NEWS

A new threat emerges for US lakes and rivers. Your lawn or toilet may be partly to blame.

50 years after the Clean Water Act clamped down on industrial pollution and amid climate change's impact across the U.S., runoff from roads, lawns, farms and septic tanks pose a new threat.

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Key Points

- Runoff from roads, lawns, farms and old septic tanks is polluting US waterways, driving harmful algae blooms.
- Climate change means heavier rainstorms carry more pollution to warmer waters primed for algae spread.
- About half of US lakes and rivers are now too polluted to be used for fishing, swimming or drinking water.

Some call Lake George the “Queen of American Lakes.”

Millions of visitors each year are drawn to its crystal clear waters, bountiful islands, and the backdrop against the Adirondack Mountains in upstate New York. Families camp, fish, boat, and otherwise take in the natural world.

If anywhere is pollution-free, this picturesque place would seem to be it.

Except it isn’t. Not anymore.

For decades, human development has crept to the banks of Lake George. Septic tanks dotting its edges are aging and failing, seeping contaminants into the groundwater and then into the lake. Increasingly heavy rainstorms, a product of climate change, carry oil, road salt, and fertilizer from roads and lawns into its waters.

Global warming is also raising air and water temperatures, creating the conditions for what happened in 2020: Lake George’s first known bloom of blue-green algae.

Often an indicator of pollution, harmful algae blooms have grabbed headlines in the Great Lakes and Gulf Coast states in recent years. But to Eric Siy, president of the nonprofit Lake George Association, its appearance in Lake George presented a bright, neon warning sign of a nation's troubled waters.

"This is a pandemic in its own right," Siy said. "We're setting ourselves up for a runaway train of a problem."

The swift rise in algae blooms across the nation is the most visible symptom of a much deeper problem facing U.S. waterways, experts say. Over the past 50 years, the buildup of agriculture and human development nationwide has created an immense strain on lakes, rivers, and streams in virtually every region of the country, threatening the ability of Americans to safely fish, swim, and drink from our waters.

Passed in 1972, the U.S. Clean Water Act at first vastly improved the nation's waterways, primarily by clamping down on pollution coming from industrial factories and sewage treatment plants. The effort cut down on the large, stinky "dead zones" near major cities, most notoriously Cleveland's Cuyahoga River, where industrial oil slicks repeatedly lit on fire leading up to the passage of the law.

But, experts say, the law paid little attention to polluted runoff from a vast constellation of American farms, towns, businesses, and homes. When it rains, these landscapes spill a cocktail of pollutants into water where they harm ecosystems and pose deadly threats to drinking water and swimmers.

After half a century of agricultural and residential development, these types of "nonpoint source" pollution, largely an afterthought 50 years ago, are now the chief water quality concern in many parts of the country. Making matters worse, climate change is warming lakes and rivers, which can further exacerbate large fishkills and algae blooms.

"This is a recipe for disaster," said Silvia Secchi, a watershed scientist at the University of Iowa. "Because we didn't do anything about it for nearly half a century, the problem has festered."

This March, the nonprofit Environmental Integrity Project released a report showing that 50% of the nation's rivers and streams and 55% of its lakes are now "impaired," according to data from the U.S. Environmental Protection Agency. That means half of such waters nationwide are too polluted to safely be used for recreation, fishing, or drinking water, or cannot support populations of animals, from oysters to otters.

That follows a prior investigation by the Natural Resources Defense Council that tracked an exploding number of algae blooms across the U.S. between 2008 and 2020, ultimately impacting all 50 states.

Signs of waters in distress are everywhere.

In Iowa, fertilizer and manure runoff from the state's agricultural sector has choked rivers like the Des Moines to the extent that the city is now drilling for cleaner groundwater to ensure the safety of its drinking water. The Des Moines ultimately drains to the Mississippi River, which carries so many pollutants from the heart of America that a dead zone as big as New Jersey forms off the coast of Louisiana each summer.

In Florida, leaky septic tanks and other runoff is helping drive algae blooms along more than 100 miles of the Indian River Lagoon, contributing to the death of thousands of acres of seagrass and hundreds of manatees that rely on it.

In California, the paving over of cities like Los Angeles is forcing plastics and pollutants into waterways and limiting the recharge of the local groundwater, intensifying a need to pipe in water from elsewhere in the drought-stricken state.

"It's death by a thousand cuts," said Bruce Reznik, the Los Angeles River waterkeeper. "And it's very hard to fix."

Experts across the country agree solutions are elusive. Some advocate for a modern-day reworking of the Clean Water Act and its regulations to crack down on nonpoint source pollution. Others favor incentive-based systems to prompt farmers and homeowners to voluntarily adopt best practices.

Without any action, many experts see a future of growing harm to humans and animals alike. But any fix will inevitably require a difficult recalibration of the American way of life, from how we produce and consume our food, to how we maintain our roadways, to how we care for our lawns and pick up after our pets.

"The question is, how do you provide a mix of measures to inform and empower people to do the right thing?" Siy said. "Because I do think most people want to do the right thing."

A drinking water threat

In Des Moines, generations of Iowans have relied on the river for their drinking water, as well as the Raccoon River that empties into it in the heart of town. But that dependence is

now in doubt.

In two of the past three years, the city has had to stop using the Des Moines for drinking water after pollutants from upstream fertilizers led to harmful algae blooms, said water utility CEO Ted Corrigan. In addition, drought conditions have cut dangerously into the flow of the Raccoon.

With nowhere to turn, the city is planning to drill three or four groundwater wells along the Des Moines riverbanks, where Corrigan said sand and gravel will help filter impurities. The project will cost $50 million, but the city is out of options; a federal judge dismissed in 2017 a lawsuit seeking to impose regulations upon upstream farmers.

The Clean Water Act has “left Iowa behind,” Corrigan said. “Our most challenging water-quality issues are related to agriculture, and it’s almost completely exempted” from the federal law.

Similar stories abound nationwide.

In 2014, the city of Toledo, Ohio, had to shut down the drinking water of more than 400,000 people for several days after it was contaminated by algae bloom on Lake Erie, the most developed of the Great Lakes. The following year, an algae bloom stretched 650 miles on the Ohio River, threatening numerous water treatment plants.

Blue-green algae is actually not an alga at all, but cyanobacteria that can cause serious health risks to humans, including vomiting, diarrhea, body aches, and even pneumonia.

Such acute illnesses remain the top concern from runoff pollution, said Steve Via, director of federal relations for the American Water Works Association, a nonprofit representing water utilities nationwide. In addition to cyanobacteria, organisms like the microscopic parasite cryptosporidium, which can cause severe gastrointestinal distress and death, can enter drinking water after pollutant-laden water disrupts normal treatment processes.

After a major outbreak of cryptosporidium killed 69 people in Milwaukee in 1993, drinking water utilities began focusing on addressing dangers across their watersheds, not just at their water intakes, Via said.

“You’ve got to be looking upstream: Is my supply going to be impacted by (pollutants), by algae blooms?” Via said. “You do that to install the right kind of treatment, and so you’re able to spot and respond before that treatment is inadequate.”

Agricultural and urban pollution presents other risks to drinking water. Nitrates, a primary contaminant from fertilizers and manure, are dangerous to humans above the EPA's safety limit of 10 milligrams per liter in drinking water. Exposure above that level can cause "blue baby syndrome" leading to serious illness or death in infants, as well as increased heart rate, nausea, headaches, and abdominal cramps in adults.

Research has shown a doubling of the number of water utilities violating the nitrate safety limit in the past several decades, now reaching more than 500 annually. Scientists have found acute nitrate pollution stretching across the country from the Central California Valley to the Midwest and Great Plains to Pennsylvania's Amish country and Delaware's coastal plains.

Even successful treatment of these polluted waters comes with drawbacks. When large amounts of debris and runoff enter a waterway after a rainstorm, treatment plants use chemicals like chlorine to kill potentially harmful pollutants. But that process creates disinfection byproducts in the water, some of which are cancerous at high levels. These layered threats prompted a collection of scientists and water regulators to issue an "urgent call to action" to the EPA in 2009 to find a way to reduce the pollution outright.

Pointing out the threat to inland waters and coastal estuaries, the report's authors warned, "nitrogen and phosphorus pollution has the potential to become one of the costliest, most difficult environmental problems we face in the 21st century."

A risk to humans and animals alike

Two years ago, Sandi Richardson and her two young children were enjoying a summer day along the banks of Indiana's White River. They knew not to swim. The river slices through the state and has a long legacy of both urban and rural pollution.

But her 4-year-old son slipped from a log and fell in. Two days later, he was sick with fever and black diarrhea. The doctor's diagnosis: a bacterial infection – the exact type someone might get from exposure to E. coli through contaminated water.

Though her son recovered, and it's not possible to confirm his infection came from the river, Richardson wonders what else it could have been. Now, she takes part in a state effort to track water pollution back to its sources, which experts say often traces back to agricultural runoff.

“That freaked me out,” she said. “That week definitely was the week where I decided I needed to do something.”

Across the country, polluted waterways are having profound impacts on both the animals that depend on clean water and the people who enjoy its recreational benefits.

Water quality in the Puget Sound in Washington is under threat from a variety of sources, including runoff from Seattle and other population centers, as well as aging sewage treatment systems that overflow when heavy rains arrive. Conditions are now a far cry from the pristine waters that generations of the Indigenous Suquamish Tribe have relied upon to harvest salmon, crabs, clams and oysters.

Indigenous people have had to shut down some harvesting activities in recent years due to the lack of healthy shellfish populations, said Leonard Forsman, the tribe’s chairman. They even fear for their own health, soaping down canoes after ceremonial paddles to guard against infection.

Tiring of the pollution, the tribe has considered suing nearby King County in order to cut down the number of sewage spills into the sound.

“It’s difficult to take these actions, but our people here are really frustrated,” he said.

On the coast of North Carolina, millions of hogs eventually bound for dinner plates are concentrated on large, industrial farms. Their waste is often pooled into open-air lagoons, which can overflow during storms and cause harmful algal blooms, eating up oxygen essential to animal life, according to the Southern Environmental Law Center.

Following intense storms like 2016’s Hurricane Matthew, large fish kills have been observed in nearby waterways like the Neuse River.

“On the coast, the biggest threat is to our commercial fishing and shellfishing industries, along with our recreation industry,” said Geoff Gisler, a senior attorney at the center.

On the southwest tip of Cape Cod in Massachusetts, scientists at the Marine Biological Laboratory have for decades tracked the health of postcard-perfect estuaries like Waquoit Bay.

Over the past several decades, the Clean Air Act has cut down on nationwide nitrogen emissions from cars and industry, sharply reducing the number of pollutants reaching the bay by air. But growing real estate development and aging septic systems have overwhelmed that trend and driven nitrogen levels in the Waquoit to unprecedented levels.

The pollution has killed off once bountiful eelgrass, pushing it to just a few spare pockets of the bay. Populations of fish and scallops, which depend on it, have also fallen. Underwater algae have taken the place of the eelgrass, occasionally washing up in unsightly clumps on beaches.

A continued drop in air emissions has bought some time before the eelgrass fully disappears, said Javier Lloret, a research scientist at the laboratory.

But the window is closing.

“It’s only giving us a little more time to act,” Lloret said. “This is the time to do something.”

The pollution solutions

The Chesapeake Bay sits just 30 miles from Capitol Hill, making it the home watershed for federal officials with the power to decide the fate of the nation’s waterways.

But even for the Chesapeake, everything hangs in the balance.

Harry Campbell, a director of science policy and advocacy for the nonprofit Chesapeake Bay Foundation, said the health of the watershed has substantially improved since the passage of the Clean Water Act 50 years ago.

But the cracks are showing. Large quantities of agricultural runoff pose a primary threat, followed by urban runoff and sewage, as well as continuing industrial pollution. Brook trout, rockfish, eel, and shellfish populations are under threat. The act’s goals of “swimmable, fishable” waters are unrealized. And climate change is bearing down, perhaps putting the full restoration of the bay out of reach.

To combat the pollution, Campbell works to improve best practices in Pennsylvania’s agricultural sector, a large contributor to pollution in the Chesapeake. That puts him among a growing band of advocates working on runoff pollution across the country.

But how do you stop pollution that’s coming from everywhere?

“I don’t believe there’s a magic bullet,” Campbell said.

After Des Moines’ legal defeat, Iowa has become perhaps ground zero for voluntary efforts.

Ruth McCabe, a conservation agronomist at Heartland Cooperative in central Iowa, believes in the ability of farmers to get the job done. The scale is Herculean – 23 million acres of

cropland across the state – but McCabe takes it one farm at a time.

“My mantra is ‘another practice, another grower, another acre,’” McCabe said.

The practices she preaches include adding cover crops like rye and oats after corn and other staples are harvested, which helps to retain soil and nutrients. Also, she urges the planting of natural vegetation to keep runoff out of waterways and educates farmers on how to stabilize their soil, their most valuable asset.

But Secchi, the University of Iowa water researcher, is skeptical. Trends in Iowa are heading in the wrong direction, she said. Without any regulation, there’s no requirement to perform best practices.

She also believes incentives are misaligned, with farmers pushing their land to the limit to meet American consumers’ expectations for cheap meat. In Secchi’s view, that means Americans need to eat less meat and pay more for it so farmers can afford to implement more holistic practices.

“We need to change the way we eat if we don’t want to have problems going forward,” Secchi said.

Money for farmers is also on the mind of experts like Via, with the American Water Works Association. He is skeptical the modern political environment will allow a significant overhaul of the federal Clean Water Act. But, he notes, Congress passes a farm bill about every five years that divvies out hundreds of billions of dollars to the agricultural sector. If even a small percentage of that paid farmers to protect rivers and streams, Via said it could go a long way.

“That’s a real investment in the agricultural communities that can benefit the downstream water supplies,” Via said.

Others believe laws and regulations must come into play. Gisler, the environmental attorney in North Carolina, believes an easy start is for the EPA to use powers under the Clean Water Act to target the largest farms producing the most waste. Anne Giblin, a scientist on Cape Cod, believes local regulations requiring the replacement of septic systems with those that remove nitrogen, paired with new funding sources, would be an effective combination of carrot and stick.

But ultimately, an update to the Clean Water Act to “tune up the language” and address modern concerns by giving regulators more oversight remains a powerful option, said Eric

Schaeffer, executive director of the Environmental Integrity Project and a former director of the EPA's Office of Civil Enforcement. Such an effort, while politically difficult, would help the agency formulate water quality standards and a plan fit for 21st century challenges.

"Big problems are hard," Schaeffer said. "You've got to see that finish line ahead of you and understand what you're working toward."