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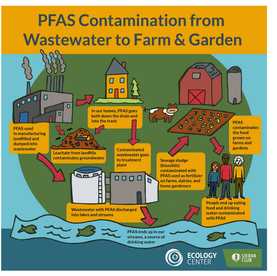


An illustration shows how PFAS get into wastewater and eventually in farms, gardens and people. (Ecology Center/Sierra Club)

Michigan treatment plants with the highest levels of PFOS, the former Scotchgard chemical made by 3M, have reduced concentrations in sludge by up to 98% since the state ordered operators to trace industrial discharges into sewer systems and clamp down on the pollution, according to a report released in April.

"We are striving for the lowest possible PFOS levels," said Abigail Hendershott, executive director of the Michigan PFAS Action Response Team, organized by former Gov. Rick Snyder in 2017 to coordinate the efforts of seven state agencies.

Minnesota last sampled sludge during 2020. Like their counterparts in Michigan, officials at the Minnesota Pollution Control Agency had early successes reducing PFAS concentrations in some of the most contaminated cities.

"Chasing PFAS can sometimes feel like chasing a ghost," the Minnesota agency says on its website. "We have learned that much more work would be needed to get to the necessary levels of prevention and protection."

[*Persistent former whose cows died from a mysterious disease helped unravel the origin of chemicals*]

Michigan and Minnesota reduced PFAS concentrations by adding the chemicals to a program that requires industry to filter and safely dispose of heavy metals before discharging waste into sewers. The MWRD has its own pretreatment program for metals. But Perkovich, the district's executive director, told elected commissioners in 2020 there is "no sound basis" to include PFAS.

The district is just now attempting to figure out where forever chemicals are coming from in Chicago and Cook County, emails and memos show.

In Maine, the state's Center for Disease Control and Prevention concluded that merely reducing PFAS in sludge might not protect people from health risks.

Maine adopted screening levels that trigger more investigation when PFAS testing detects certain concentrations in beef, fish, hay, milk, silage and soil. Each screening level is based in part on a now-defunct EPA health advisory of 70 parts per trillion of PFOS and PFOA combined in drinking water.

Trade organizations representing sewage treatment operators contend the Maine standards are far too stringent, calling them "inappropriately low" and "nonscientific."

"The mere presence of PFAS in biosolids, even at trace levels, is causing some state regulators and, at times, the public to react in fear and prematurely limit local options," the National Association of Clean Water Agencies said in a June policy statement.

Yet the U.S. EPA's announcement last month that PFOA and PFOS are unsafe at practically any level suggests the agency's failure to regulate forever chemicals in sludge could be endangering millions of Americans.

"It's probably going to cost more money to landfill sludge instead of spreading it on farmland," said Patrick MacRoy, deputy director of the Maine nonprofit group Defend Our Health. "But there are a hell of a lot of benefits to not having contaminated milk and crops."

'A national solution'

The MWRD once dumped most of its sludge in landfills on Chicago's Southeast Side. Disposal became more expensive for all of the nation's sewage treatment plants during the late 1970s after Congress ordered more stringent regulation of landfills, and costs increased again during the early 1990s when federal lawmakers outlawed the dumping of sludge into oceans.

Giving away sludge to farmers became the cheapest option for many cities.

Promotional materials from public works agencies, industry lobbyists and the EPA highlight the plant-friendly qualities of sludge. Some researchers also have become champions of spreading the waste on farmland.

"I can show you fields where plants love biosolids," said Linda Lee, an environmental chemistry professor at Purdue University who leads or is involved in several sludge studies funded by the EPA and the sewage treatment industry. "Banning biosolids is not a sustainable alternative."

Sludge from the Metropolitan Water Reclamation District is dumped and spread on a field formed by Ray Swimmering on June 14, 2022, in Will County. (Ena Kadic / Chicago Tribune)

Echoing statements from industry lobbyists, Lee said the solution is to keep forever chemicals out of sewers in the first place. "What we should be doing right now is getting rid of sources and then regulating nonessential uses of PFAS out of the marketplace," she said.

In December, a University of Arizona researcher sent an email to sewage districts across the country urging them to contribute tax dollars for a broad study of PFAS in sludge.

"We need a national solution," wrote Ian Pepper, a professor of environmental science and public health. "I hope you will consider this proposal as a national ban of land application is a real threat."

An MWRD researcher serves on an advisory committee organized by Pepper. At the local official's request, an association of Illinois sewage treatment agencies chipped in $5,000 for the professor's study.

"If you don't get to land-apply biosolids, what are your other two options? Incineration or landfilling," Pepper said in an interview. "Neither is a really good idea."

That said, Pepper and Lee agreed that sludge contaminated with certain, but still undefined, levels of PFAS should not be spread on farmland.

Cameron Davis, one of the MWRD's elected commissioners, has been pressing the district's staff to address the PFAS dilemma.

"Public utilities across the country didn't create this problem, but they're forced to deal with it in ways that put the screws to all of us," said Davis, who coordinated efforts to restore and protect the Great Lakes during the Obama administration. "I know two things for sure: Protecting public health comes first, and manufacturers need to be held accountable instead of taxpayers."

'Still out there'

Without more widespread testing, it remains unclear if horrifying scenarios documented in recent years are unusual, as the sewage treatment industry insists, or more common than anyone realizes.

At the end of January, Michigan ordered a farmer outside Detroit to stop selling beef to schools and other customers after state officials found alarming levels of PFOS in hay, silage and water fed to his cattle. The farmer had fertilized some of his land with sludge from a nearby treatment plant where the state detected high levels of the forever chemical during 2018.

Michigan officials told the Tribune that PFOS concentrations in the farm's beef weren't as high as what the federal government has found in other parts of the country but were still concerning because "prolonged exposure to PFOS may be a public health risk."

In Maine, at least a dozen farmers have been sidelined because their milk or vegetables or crops are contaminated.

Adam Nordell and Johanna Davis grew organic vegetables and grains on land the couple owned or leased about 20 miles from the Atlantic coast.

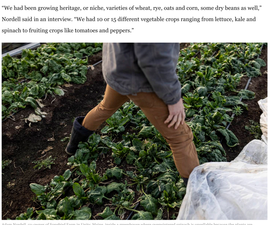
Adam Nordell, Johanna Davis and their son at Songbird Farm in Lisbon, Maine, on March 21, 2022. The couple bought their farm seven years ago, but suspended operations in late 2021 after discovering their land and water is contaminated with high levels of forever chemicals, also known as per- and polyfluoroalkyl substances or PFAS. (Brianna Soukup/For The Washington Post)

They called their venture Songbird Farm. The first parcel Nordell and Davis bought in 2014 already was an organic farm. By last year their sales to markets on the coast were robust enough they decided to drill a new irrigation well and made plans to open a bakery with goods made from the farm's grains.

But after a customer told Nordell last fall about the state's emerging PFAS problems, he found an online map that showed Songbird Farm had been fertilized with sewage sludge during the early 1990s, years before Nordell, Davis and the previous owner had tilled the land.

Unwilling to wait for the state to collect and analyze samples, Nordell and Davis paid to have their soil, spinach and water tested. A contract laboratory detected PFAS in every sample; levels in the farm's water were 400 times higher than state standards.

"We had been growing heritage, or niche, varieties of wheat, rye, oats and corn, some dry beans as well," Nordell said in an interview. "We had 10 or 15 different vegetable crops ranging from lettuce, kale and spinach to fruiting crops like tomatoes and peppers."



Adam Nordell, a graduate of Bowdoin College in Maine, stands in a greenhouse where a commercial growth is unreliable because the plants are contaminated with toxic forever chemicals, March 22, 2022. (Brianna Soukup/For The Washington Post)

All of the couple's efforts ground to a halt at the end of 2021.

Nordell and Davis told customers what the PFAS testing had found on the farm and suspended operations. Then they had themselves tested.

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Levels of PFAS in the couple's blood were 250 times higher than the average American, Nordell said, noting that workers in some industrial settings are less contaminated than he and his wife.

The Maine couple's experience is a cautionary tale about modern farming in the United States.

"What is a corn field today could be housing at some point, with PFAS in the ground where children play and in the drinking water wells poking into contaminated groundwater," said Nordell, who in June joined the Maine nonprofit Defend Our Health as an advocate for the state's farmers. "These chemicals don't go away. They are still out there, waiting for us."

Nordell, 39, lamented that based on what scientists know about the chemicals, he will be in his 70s by the time the PFAS coursing in his blood leaves his body.

Asked if he and Davis want to return to farming, Nordell paused for several seconds.

"My heart is broken," he said haltingly. "The things that motivated me to farm feel meaningless in light of the contamination. It's difficult to justify all of our hard work when this is the outcome."

mhauerbach@chicagotribune.com

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