



Cottage Grove, Minnesota is home to a factory that has been churning out various PFAS since the 1950s for water- and stain-repellant products.

PHOTOGRAPH BY DANIEL ACKER,  
BLOOMBERG/GETTY IMAGES

SCIENCE NEWS

# Toxic ‘forever chemicals’ more common in tap water than thought, report says

Testing done by an environmental watchdog shows a class of chemicals called PFAS are running through dozens of U.S. cities. Here's what you should know.

BY SARAH GIBBENS

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You may not recognize the name PFAS, short for poly and perfluoroalkyl substances, but you likely come into contact with it regularly, maybe multiple times a day. You might even consume it.

Put simply: PFAS, a class of more than 4,000 different chemicals, is everywhere. It turns up in everything from household items to [fast food wrappers](#). It's even been [found in our blood](#). And [new research](#) published this week by the non-profit [Environmental Working Group](#) (EWG), shows it's prevalent in tap water as well.

The public and policymakers are taking notice.

In December a military spending bill included new PFAS regulations, though environmentalists say the included measures didn't do enough to meaningfully address contamination. Earlier this month the U.S. House of Representatives passed a resolution ([H.R. 535](#)) that will be voted on in the Senate later this year. And in September, the movie *Dark Waters* offered a fictional take on a 2016 [New York Times](#) article about how corporate lawyer Rob Bilott took on DuPont, one of the largest polluters of PFAS.

“If we’re comparing what we know about these chemicals to lead, then I can say lead is more dangerous. If we compare what we know now with what we knew about lead 50 years ago, it’s hard to say which will win,” says Cindy Hu, a Harvard data scientist who was part of a research team that, in 2016, found at least six million Americans were drinking PFAS-contaminated drinking water that exceeded EPA recommendations.

## What and where is PFAS?

PFAS has been used in commercial products since the 1940s. It’s created by joining carbon and fluorine, one of the strongest bonds that can be made in organic chemistry. It’s that bond that’s at the root of why PFAS chemicals are used to make everyday items resistant to moisture, heat, and stains. Some of the most commonly used PFAS chemicals, like PFOS and PFOA (perfluorooctanesulfonic acid and perfluorooctanoic acid) have long half-lives, earning them the moniker “the forever chemical.”

In tests of 44 different taps in 31 states, the EWG found that 43 exceeded a limit they deem safe by their own standards.

“I think it’s one of the biggest threats in

complete understanding of, and it’s been around for decades,” says David Andrews, a senior scientist at the EWG who was involved with the report.

[\(Learn more about the sources of freshwater pollution.\)](#)

We come into contact with PFAS through the things we buy like furniture and clothing, but [according to the EPA](#), most drinking water contamination results from living near facilities that handle PFAS, like manufacturing plants or wastewater treatment facilities. The [average household water filter](#) isn’t capable of removing PFAS from the tap, but [larger and more expensive filters](#) that claim to remove PFAS are on the market.

Only two of the areas the EWG tested—Brunswick County, North Carolina and Quad Cities, Iowa—had tap water samples that exceeded EPA limits for PFOS and PFOA. The EPA has a [health advisory for the two chemicals](#), saying that they shouldn’t exceed 70 parts per trillion (ppt) in drinking supplies. Health advisories function differently from the EPA’s list of officially regulated chemicals; it’s essentially the agency’s way of acknowledging a chemical shouldn’t be in drinking water. And advisories have no enforcement power.

The EWG advises a much lower limit, saying any sample that exceeds 1 ppt could be potentially harmful. Their limit is based on a [handful of studies of PFAS in rodents and humans](#).

Notably, Hu disagrees with the way the EWG tallied their samples. Their results show any chemical that falls under the PFAS class, rather than looking at individual chemicals like PFOA and PFOS. Hu adds that scientists haven't reached a consensus on whether to regulate PFAS on an individual basis or as an entire class.

## Who's at risk?

When Wilbur Earl Tennant, a farmer in Parkersburg, West Virginia, lost more than a hundred cattle, he suspected it was the nearby DuPont manufacturing plant poisoning the area's ground and water. A lawsuit against the company settled in 2017 revealed that DuPont was dumping PFOA, the type of PFAS used in non-stick cookware and rainproof coats, into a dump adjacent to Tennant's farm.

The lawsuit prompted an 852-page report released by the [CDC in 2018](#) that showed the EPA overestimated the amount of PFAS chemicals people could safely consume. The

chemicals and cancer, birth defects, thyroid disease, and liver damage. Other studies on PFAS have linked consumption to high cholesterol and nerve disorders.

While those living adjacent to major manufacturers that use PFAS are more at risk, the products made from various PFAS chemicals are so ubiquitous—cleaning products, non-stick pans, rainproof coats, stain resistant carpet, food packaging—that just about everyone has it in their bodies. Regular testing [conducted by the U.S. Agency for Toxic Substances and Disease Registry](#) finds it present in nearly every blood sample they take.

Notably, levels of PFOS and PFOA have decreased since 1999, when the agency began sampling. That’s likely because they haven’t been manufactured in the U.S. since the early 2000s, though they can still be found in imported goods like textiles, carpets, and plastic. PFAS alternatives to PFOA and PFOS have also been linked to health complications. In a toxicity report of [two popular replacements](#), the EPA found each could lead to kidney damage, immune system impairment, and reproductive issues.

When asked to comment on the EWG’s latest report, a representative from the EPA

which they say, “commits the agency to take important steps that will enhance how the agency researches, monitors, detects, and addresses PFAS.”

## What’s being done about it?

Of the prevalence of PFAS found in their study, Andrews says, “It’s a clear indication that the EPA and their ability to set clean drinking water standards is completely broken.”

Chemicals found in tap water are regulated by the Safe Drinking Water Act, which passed in 1974. However, a new chemical hasn’t been added to the list since 1996 because of an amendment that allowed the EPA, instead of Congress, to decide when to add a new chemical into its regulatory repertoire. The amendment also made it more difficult to prove that a chemical was irrefutably a human health threat.

Last December, the agency submitted PFOS and PFOA for internal review where its regulatory fate is still being deliberated.

To circumvent federal inaction, many states have enacted their own limits on PFAS. And some companies have pledged to remove known PFAS chemicals from their businesses.

“The EPA has had PFOS and PFOA on their radar for quite a while. We have quite a bit of evidence to establish a drinking water standard, so it does point to how difficult it is for them to establish drinking water guidelines or phase out chemicals that cause harmful health effects,” says Laurel Schaider, a research scientist at the Silent Spring Institute.

Schaider isn’t optimistic that the House’s bill on PFAS will get enough votes to pass in the Senate, but she’s hopeful states will continue setting their own guidelines. [Q](#)



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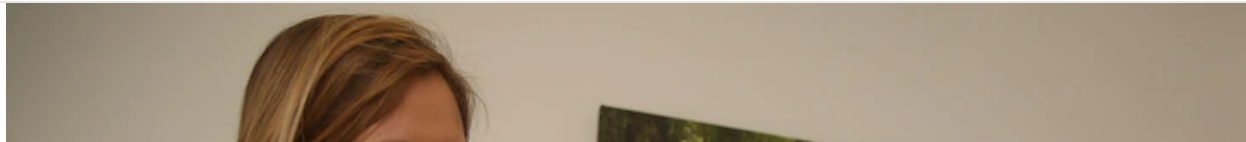
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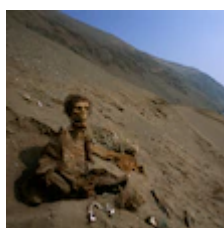




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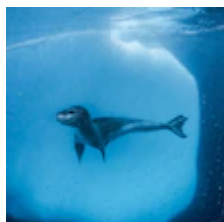
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