

Dangerous chemicals found in South Carolina's fish, crabs and oysters. Here's what we know

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Chemicals that can make people sick have recently been found in fish, crabs and oysters in South Carolina as concerns grow about the threat the toxins pose to food and water across the Palmetto State.

The S.C. Department of Health and Environmental Control documented the pollutants, known as forever chemicals, in [freshwater fish](#) caught in 18 waterways from the foothills to the coast. In some cases, the pollutants were found at high levels, state data show.

All told, more than a dozen species contained forever chemicals, and many [fish](#) tested came from some of South Carolina's most popular spots for fishing, including Lake Greenwood, the Great Pee Dee River, Lake Marion and the Wateree River, DHEC data show.

Fish with forever [chemical](#) contamination included largemouth bass, bluegill, channel catfish and black crappie, species traditionally eaten by recreational anglers and subsistence fishermen.

A little known threat for decades, forever chemicals have become a major concern in recent years as health care researchers, environmentalists and others have learned about the dangers.

In July, The State reported on hazards created by forever chemical-tainted sludge that unsuspecting farmers spread on their land in South Carolina. In August, state Attorney General Alan Wilson sued the manufacturers of forever chemicals.

DHEC's recent testing of fish, which follows the finding of forever chemicals in rivers and [drinking water](#), showed that one type of chemical—PFOS—was the most predominant showing up in fish tissue.

Agency tests generally found lower amounts of PFOS and other forever chemicals in blue crabs and oysters.

DHEC, which is charged with protecting [public health](#) in South Carolina, said it does not plan to issue warnings about forever chemicals in fish, oysters and crabs, even though some states have done so.

Recent DHEC testing in South Carolina was limited and not complete enough to justify issuing warnings, the agency said in an email to The State. The agency, which plans additional fish testing, also needs guidance from the federal government, the email said.

When asked if fish are safe to eat, agency officials said the levels of forever chemicals in fish "don't appear to be high enough to substantially affect most people's overall" exposure to forever chemicals.

But the department did not elaborate on how it reached that conclusion, and its position appears to be in contrast to recent studies.

In an analysis of federal fish testing data earlier this year, the Environmental Working Group concluded that eating fish with forever chemical pollution could be substantially more toxic to people than drinking water polluted by the chemicals. The Environmental Working group is a national environmental organization that has been doing research on forever chemicals across the country.

"There's a need to get this information out," the group's David Andrews said of fish test results, explaining that many states have been slow to issue advisories for forever chemicals in fish.

"Many places do need fish advisories. A few states have done specific advisories, but in the scope of the country, it has been relatively limited. States have been kind of hesitant to take the lead and provide public health guidance. And I think that is a lost opportunity."

Hidden dangers

In addition to the Environmental Working Group study, a team of scientists concluded in 2019 that warnings might be needed after finding that certain fish from the Charleston area contained potentially harmful

levels of forever chemicals.

PFOS levels in some fish filets exceeded cancer risk levels, the researchers said. Their study was headed by a Medical University of South Carolina scientist. The report said consumption advisories "should be considered as a prudent public health measure" while additional research was underway.

Forever chemicals, known formally as per and polyfluoroalkyl substances, or PFAS, are tied to an array of health problems in people exposed over time. Increased chances of kidney cancer and breast cancer are among the health threats, as are [high blood pressure](#), suppressed immune systems and thyroid disease. The main pathways for exposure are food and water.

Thousands of per and polyfluoroalkyl substances have been used worldwide since the first were developed in the 1940s. They help prevent sticking in frying pans, repel water from clothing and limit stains on carpets. They have also proven effective as an ingredient in firefighting foam. They are called forever chemicals because they do not break down easily.

For years, 3M and DuPont, the main manufacturers and distributors of these chemicals, did not tell the public about the hazards of forever chemicals, despite in-house studies that showed their toxicity. That has sparked a flurry of lawsuits nationally, including legal action by Attorney General Wilson.

Health regulators are now being pushed to find out what sources are releasing the chemicals and to stop the discharges. That won't help fish now contaminated by PFOS or other forever chemicals, but over time, it could make a difference, environmentalists say.

Carl Brzorad, an attorney with the Southern Environmental Law Center, said DHEC's recent findings of PFOS in fish is reason for worry.

Brzorad said he's wary of eating fish from certain rivers where forever chemicals have been documented until more is known. Fish have traditionally been viewed as a healthy alternative to eating red meat.

One river he's seen firsthand that has drawn his concern is the Pocotaligo near Manning, he said. Brzorad works on forever chemical issues for the non-profit legal group.

"What we know is not good," he said. "We expect DHEC to figure out where this stuff is coming from and do something to address it."

Where is it coming from?

At this point, nobody knows for sure where the forever chemical pollution in fish originated. DHEC has previously said farm fields fertilized with sewer sludge, industries, wastewater plants and military bases are potential sources.

The release of the fish, oyster and crab data is the result of a comprehensive department program to check for forever chemicals in the environment during the past three years.

Previous studies have identified forever-chemical contamination in virtually every river tested across South Carolina and in dozens of drinking water plants. In many cases, the contamination levels are higher than a proposed federal safe drinking water standard.

But recent tests show that PFOS levels in fish were often noticeably higher than the amounts found by DHEC in rivers or drinking water systems.

The highest PFOS level documented in South Carolina fish exceeded 700,000 parts per trillion, agency data show.

The highest levels DHEC documented in South Carolina rivers last year were only a fraction of that, records show. Drinking water levels were lower, although many slightly exceeded the proposed new standard of 4 parts per trillion.

It's unclear why fish tissue registered substantially higher levels, but some types of pollutants, such as mercury, have been shown to build up in fish over time to higher amounts than the water they live in.

DHEC officials said they don't know why there are differences. The agency also cautioned against comparing data from fish tissue to water.

"There isn't a way to know at this time how or why certain species are possibly impacted by PFAS more than others and how that may be relative to the water around them," the agency said in an email Thursday. "As noted previously, this is our preliminary data that we're using to help steer our next steps, and we can expect to learn more as we continue to perform additional fish tissue sampling."

The highest forever chemical reading DHEC found in South Carolina fish—732,000 parts per trillion for PFOS—came from the Broad River near Gaffney, a community southwest of Charlotte not far from the North Carolina border. Fish with the highest levels were bluegill.

The area, dotted with fields where sewage sludge is applied, also has registered some of the highest levels in drinking water in the state for certain types of forever chemicals. Drinking water comes from a reservoir and the Broad River.

There is no federal food consumption standard in which to compare the

Broad River fish test results, DHEC says, but a handful of states have issued advisories against eating fish contaminated with comparable or lesser amounts.

Michigan, for instance, has warned the public not to eat fish in certain areas when contamination exceeds 300,000 parts per trillion for filets. Michigan advises against eating more than one meal a week of certain fish species that have PFOS levels much lower than 300,000 parts per trillion, according to the Environmental Working Group.

Maine, where sludge fields have polluted water with forever chemicals, warns against eating fish in areas where the fish have registered PFOS levels of 60,000 parts per trillion or more. In Massachusetts, the state Department of Public Health warns the general population not to eat fish with PFOS concentrations greater than 183,000 parts per trillion.

Hot spots in SC

In addition to the fish results from the Broad River near Gaffney, other high levels of PFOS were found in fish caught from:

- Lake Conestee south of Greenville. Fish from Lake Conestee, including warmouth and bluegill, had PFOS levels in excess of 400,000 parts per trillion. Previous testing by DHEC found Lake Conestee had some of the state's highest levels of forever chemicals in the water. The lake has long accepted drainage from textile factories.
- The Broad River near Columbia. Fish registered PFOS levels of more than 87,000 to more than 200,000 parts per trillion in bluegill at a site near Columbia International University—just a few miles upstream from the city's canal drinking water plant. Previous tests have shown forever chemical pollution in the plant. This section of river is downstream from a textile factory

that leaked forever chemicals in Union County.

- The Pocotaligo River near Manning. Largemouth bass and spotted sunfish registered levels of more than 86,000 parts per trillion to 193,000 parts per trillion, respectively. The Pocotaligo, which drains into the Black River, has had some of the state's highest overall levels of forever chemicals in water.
- Lake Greenwood, northwest of Columbia. Redear sunfish, bluegill and largemouth bass showed PFOS levels of more than 46,000 parts per trillion to more than 58,000 parts per trillion, respectively.
- Lake Marion, southeast of Columbia. White perch and largemouth bass showed PFOS levels of more than 23,000 parts per trillion to 24,000 parts per trillion, respectively.

Lakes Greenwood and Marion are among the most popular in South Carolina for recreational fishing, according to the S.C. Department of Natural Resources. Lake Marion is the state's largest lake and is host to national fishing tournaments.

In the Columbia area, DHEC also identified forever chemicals in some fish from Gills Creek near Bluff Road and the Congaree River near Williams-Brice Stadium.

The findings by DHEC of PFOS in fish come at a time of rising questions about the impact forever chemicals already may be having on drinking water and on crops.

Forever chemicals have shown up in the drinking water of more than 50 utilities in South Carolina at levels exceeding the proposed 4 parts per trillion federal drinking water limit, according to DHEC data.

Private wells have been affected, too.

In eastern South Carolina, farmers relied on sewer sludge containing forever chemicals from a textile plant for parts of 20 years to fertilize their crops. Now, many wells are contaminated in the area near Darlington and some people who drank the water for years have gotten sick and others have died, The State reported in July.

Concerns also have surfaced about whether crops irrigated with water in the area are sucking up forever chemicals, but no agency is known to be checking the crops for possible contamination.

"This is an extremely harmful class of toxic chemicals" that is proving to be pervasive in the environment, said Amy Armstrong, who heads the non-profit S.C. Environmental Law project in Pawleys Island.

Her organization has sought tighter state restrictions on forever chemicals that threaten water supplies.

Blue crabs and oysters

While the highest levels of forever chemicals were documented in fish, noticeable levels also were found in blue crabs in two locations: the Ashley and Dawho rivers near Charleston. Levels in crabs in other locations were much lower. PFOS in oysters was low across the coast.

It's possible that PFOS is higher in fish than in crabs and oysters because fish prey on bigger animals, DHEC's email said.

"Oysters and crabs appear to bioaccumulate less PFAS than fish because they eat much smaller organisms," the agency said.

Debra Buffkin, who heads the Winyah Rivers Alliance in eastern South Carolina, said the finding of PFAS in fish tissue is particularly upsetting because the state has a large number of disadvantaged people who fish to

put food on the table.

"A lot of people in communities are using fish for sustenance: they have to eat them to survive," she said. "It's really scary. We need more testing and to find out where the chemicals are coming from."

While South Carolina has no health advisories warning of PFAS in fish, it does issue warnings for areas where mercury and toxic PCBs have been documented.

PFOS has been found in fish in some of the same areas, but unlike mercury, the forever chemical has built up in some small fish, such as sunfish, in addition to big fish. Mercury tends to bioaccumulate in large, long-lived fish, such as catfish.

Ross Self, fisheries chief at the S.C. Department of Natural Resources, said DHEC's findings are worth learning more about.

"This PFAS stuff is a fairly recent development," Self said. "We're still trying to get our heads wrapped around what this means."

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