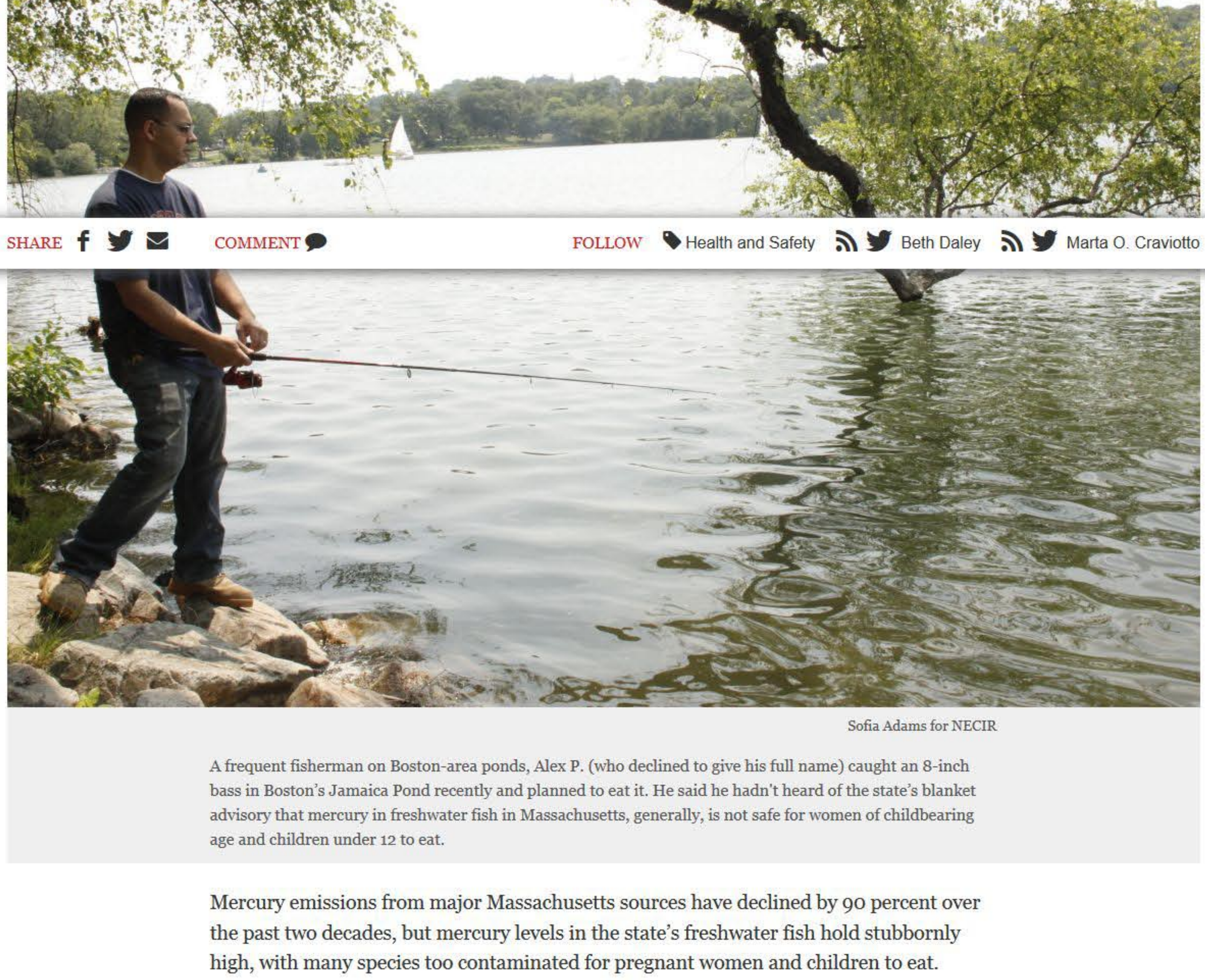


Mercury emissions down but mercury in Mass. fish remains high

By Beth Daley and Marta O. Cravioetto

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Sofia Adams for NECIR

A frequent fisherman on Boston-area ponds, Alex P. (who declined to give his full name) caught an 8-inch bass in Boston's Jamaica Pond recently and planned to eat it. He said he hadn't heard of the state's blanket advisory that mercury in freshwater fish in Massachusetts, generally, is not safe for women of childbearing age and children under 12 to eat.

Mercury emissions from major Massachusetts sources have declined by 90 percent over the past two decades, but mercury levels in the state's freshwater fish hold stubbornly high, with many species too contaminated for pregnant women and children to eat.

Yet languid summer days and the lure of Massachusetts' 3,000 freshwater bodies — from the Berkshire's Lake Pontonoscuc to Boston's Jamaica Pond — send many anglers casting for a good fish dinner.

PHOTO ESSAY: Mercury in Massachusetts lakes

The inability to reduce mercury in fish to safe eating levels troubles environment and health officials — and added to that concern is growing evidence that some freshwater fish in similar northern latitudes, from the Great Lakes to Scandinavia, appear to have increasing mercury levels after years of decline. The New England Center for Investigative Reporting found six studies in the past decade that point to increasing mercury levels in freshwater fish.

"We need to figure out what is going on," said Michael S. Hutcheson, former head of air and water toxics for the Massachusetts Department of Environmental Protection who retired last month. Reducing emissions in Massachusetts **certainly helped** — some freshwater fish near closed incinerators and other mercury sources showed a 44 percent decline in mercury levels — but the difficulty in getting further reductions speaks to a more complex problem, he said.

Large numbers of people fish the state's lakes, ponds and rivers — 172,800 freshwater fish licenses were issued in the past year. But it is unknown exactly how frequently fishermen — or families — eat catch that might be contaminated.

On Boston's Jamaica Pond one recent sunny afternoon, Shu Bao Chen of Boston tied bait to a hook as one of his two young girls dangled a fishing pole over the still water. He said he was unaware of the state's blanket advisory that no children under 12 and no women of childbearing years should eat any fish from freshwater bodies in Massachusetts.



Data: Massachusetts Department of Environmental Protection and Massachusetts Department of Public Health / Map: Cory Dawson for NECIR

We come "Sundays and Saturdays, when he has time," said Emily Chen, 13, translating for her father. The family came to Boston from China about five years ago and fish on the pond year-round. When asked what the family fishes for, Emily said "dinner."

The state has a **database** of about 250 lakes it has tested over time and, of those, 16 have fish mercury levels so high the state Department of Public Health says no one should eat fish from them. These include the popular Lake Pentucket in Haverhill, Grove Pond in Ayer, and Long Pond in Wellfleet.

Researchers are examining three leading reasons for the stubborn fish mercury levels: Mercury drifting on air currents from overseas power plants and small-scale gold mining operations, climate change, and, reductions in acid rain.

A clear picture, however, is obscured by cutbacks in fish monitoring in many parts of the Northeast and the nation, the **New England Center for Investigative Reporting** has found. Massachusetts, in recent years, has slashed by half the number of lakes it regularly samples because of budget cuts, Connecticut hasn't done a fish mercury survey in a decade, and the U.S. Environmental Protection Agency no longer has a full-time fish mercury position.

"We need data and it needs to be coordinated," said David Evers, executive director of the Maine-based **Biodiversity Research Institute**, who does worldwide mercury research and policy work.

Any answer scientists arrive at could be controversial, especially if it points to the need to reduce emissions even more. A June 29 U.S. **Supreme Court** ruling dealt a blow to the EPA's first-ever nationwide mercury rules for power plants, saying the agency did not adequately consider how much it would cost plants to comply.

A magical, poisonous metal

Few elements on earth have sparked such mystery, lure and usefulness as mercury, a naturally occurring poisonous metal that has also been used as medicine in small doses. Liquid at room temperature, it has been used in hat-making, thermometers, thermostats, and medical devices, although many uses are being phased out because of its danger. Still, tiny amounts of mercury are used today in compact fluorescent light bulbs.



Graphic by Cory Dawson, research by Beth Daley

While the metal can enter the atmosphere naturally, such as from volcanoes, much of the mercury in the air today comes from industrial activity.

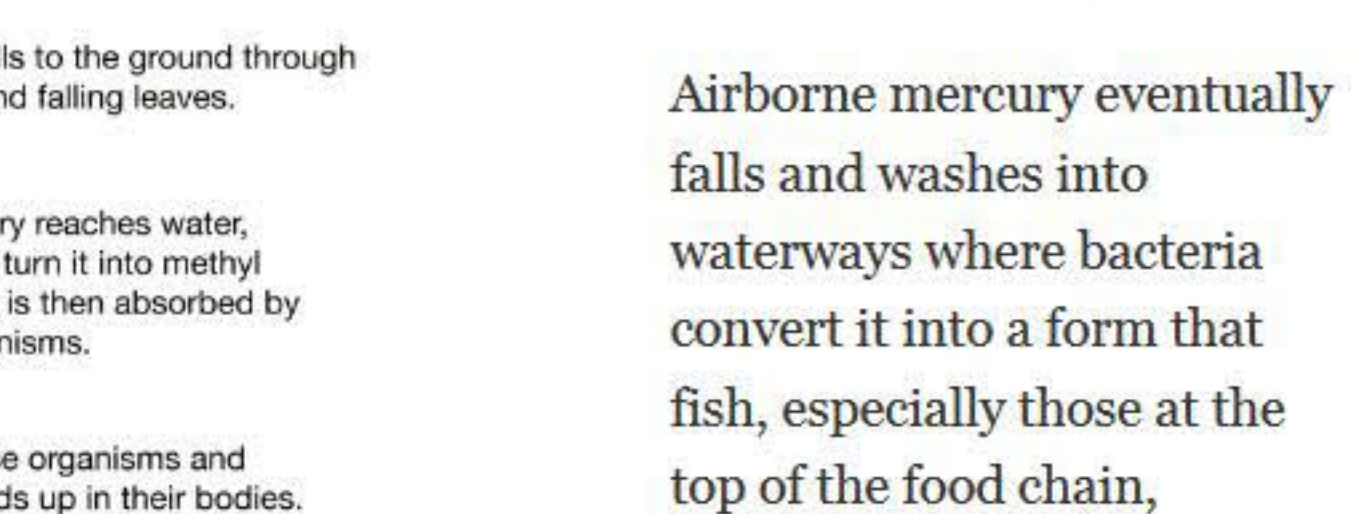
Airborne mercury eventually falls and washes into waterways where bacteria convert it into a form that fish, especially those at the top of the food chain, accumulate over time. (The waterways remain safe to swim in.)

Most people who get too much mercury get it from eating seafood, especially tuna, but others can get it from freshwater fish. Trout the state stocks in many lakes and ponds are safe to eat because they are usually caught before they have a chance to accumulate high levels of mercury.

Too much mercury in fish can harm everyone, but children and fetuses are the most vulnerable. While mercury levels in U.S. women of childbearing age is dropping, the EPA estimates there are still more than 75,000 U.S. newborns each year that may have increased risk of learning disabilities associated with mercury exposure in the womb.

"We work hard at outreach" to risky populations, said Suzanne Condon, director of the state Bureau of Environmental Health, who retired June 30. Because eating fish can also bring great benefits, she says the agency suggests other fish that women and children can eat. OB/GYNs educate would-be mothers, and advisories are on state and many local boards of health websites.

But there are inconsistencies in how the state warns anglers. Some lakes that have fish no one should eat, such as Lake Pentucket in Haverhill, have warning signs posted in English and Spanish near public access points. Yet other waterways that are as highly polluted have no signs near access points, such as Heard Pond in Wayland.



A public health advisory on Lake Saltonstall, also known as Plug Pond, in Haverhill, Mass., warns anglers not to eat certain species of fish.

Near Sheep Pond in Brewster on Cape Cod, a popular fishing spot for tourists and locals, no sign exists despite fish contamination levels so high no pregnant women and children should eat fish in it while the general public should limit consumption to no more than twice a month. In Lake Cochichewick in North Andover, where pregnant women should not eat largemouth bass and smallmouth bass and the general public should limit consumption of them as well, no sign exists.

"I didn't really know about it," said Elvin Johnson, of North Andover who occasionally fishes for bass before or after work at the lake. He doesn't take fish home, but does see others who do.

Unlocking an answer

While scientists are looking for ways that lowering mercury emissions to reduce mercury levels in fish, "there is so much else that goes on in between" mercury in the air and mercury in fish, said Bruce Monson, a mercury expert with the state of Minnesota who conducted two studies published in 2009 and 2011 showing mercury in fish creeping up in Minnesota and the Great Lakes region, especially in more northern areas. Another study, released last year in **Ontario** also found increasing levels of mercury in fish, as have studies in Norway and Nova Scotia.

A Massachusetts study Hutcheson led, which tracked fish from 1999 to 2011 in 23 lakes, illustrates the challenge of pinpointing exact answers. After a succession of state and regional regulations beginning around 2000 that limited mercury from garbage and medical incinerators, then power plants, the state seemed the perfect place to study whether fish reflected the mercury declines in the air.

In the northeast part of the state where many incinerators and power plants were located — and where mercury emissions declined some 98 percent from them — Hutcheson's team found mercury concentrations declined about 44 percent in two fish popular to eat.

But in the rest of the state, the picture was inconsistent. For example, largemouth bass levels did not show any significant downward trend of mercury levels.

"We've set a good example," said C. Mark Smith, acting director of the state office of Research and Standards and a co-author of the study. "But more needs to be done" globally.

While Asian coal plants and small scale gold mining are believed to be significant contributors to mercury problems in the U.S., exact amounts are unclear. An **international treaty** negotiated two years ago with 128 countries will go into force once 50 countries ratify it; so far 12, including the US, have.



On an early June evening, Shu Bao Chen, a Chinese immigrant, fished on Jamaica Pond in Boston for his family's dinner, unaware of the Massachusetts blanket advisory that women of childbearing years and children under 12 should not eat fish from freshwater bodies in Massachusetts.

"We need that treaty to reduce emissions across the world," said Michael Bender, founder and co-coordinator of the **Zero Mercury Working Group**, a coalition of 90 groups from 50 countries. "The good news is ... we are going to see reduced mercury pollution."

Meanwhile, scientists are exploring if wetter, more intense storms are helping more mercury convert into the form that fish absorb. They are also looking to see if reductions in acid rain — in part from other environmental controls on power plants — are allowing more mercury to be converted.

"But really, it's a head-scratcher," said Charles Driscoll, a mercury expert and professor of environmental systems engineering at Syracuse. "It's not recovering at the rate we (anticipated)."

At Boston's Jamaica Pond, where Emily Chen's dad was fishing for dinner, the child says the family cooks the whole fish to eat and then the family will return for more, "Probably this weekend."

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