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Toxins reaching to the headwaters
Airborne mercury knows no bounds

In the northern reaches of the Connecticut river, fish, wildlife and the aquatic environment are tainted with pollutants, much of it from industrial emissions.

By STEVE GRANT
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The moose are as abundant as mosquitoes. Factories, cities and highways are miles away. Forget about cellphone service.

Pittsburg is a big town, 291 square miles, the size of many counties, but only 900 residents live amid the trees, mountains, streams and lakes on the northernmost tip of New Hampshire. Posted at the boat launch on First Connecticut Lake is a sign: Adults should eat no more than four meals of fish a month from the lake, and pregnant women and children should eat no more than one meal a month.

The problem is mercury, a toxin, and in the northernmost reaches of the Connecticut River, the fish and loons can carry troublesome levels of mercury in their flesh and organs.

"It's an incredible commentary on where we're at in America environmentally," said Brian O'Donnell of Enfield, Conn., after a morning of fishing.

The mercury that fouled the Con-

necticut, which begins in Pittsburg as a chain of lakes, was not dumped there, and it didn't come from broken thermometers. It drifted in with the wind. Worldwide, airborne mercury is affecting rivers and lakes to varying degrees. At tiny Fourth Connecticut Lake on the Canadian border, the very beginning of the 410-mile-long Connecticut River, the sediments are laced with mercury.

Despite more than 30 years of far stricter environmental regulations, mercury is still emitted into the air by the ton from industrial and other sources. It falls

to earth, often many miles away, as does another airborne pollutant, nitrogen, an essential element that causes major problems when too much of it gets into a river, lake or estuary.

Mercury in rivers is so pervasive that 47 states have posted advisories instructing people to limit their intake of freshwater fish. Mercury affects not only fish but other species, including loons and songbirds, mink and otter. Exposure to high levels of mercury can harm humans' brain, heart, kidneys, lungs and immune systems. It remains at troublesome levels in the environment even though states and the federal government have made advances in controlling emissions. Indeed, mercury emissions in the United States have been falling in recent years.

William Fitzgerald, a marine geochemist at the University of Connecticut and an authority on mercury in the environment, said the use of lower-sulfur coal in this country to reduce sulfur dioxide emissions has the added benefit of also reducing mercury emissions, because low-sulfur coal also has less mercury. But mercury remains ubiquitous in the environment and will persist for years.

One trend is worrisome: Mercury emissions from rapidly developing Asian countries including China are increasing even as emissions in the United States and other highly developed countries have decreased. Some of those distant emissions may reach this country.

David Evers, executive director of the Biodiversity Research Institute in Gorham, Maine, a private research organization, said New England states have worked hard to reduce their own mercury emissions, and emissions from the region itself are unquestionably down.

"There are still problem areas for human health and ecological health on the river, even all the way up near the headwaters in the Connecticut Lakes," he said. "The landscape is saturated with mercury right now, probably more than ever before, and how long it takes nature to clean itself out is an unknown."

Mercury is a toxin, but nitrogen, another airborne pollutant, is essential to plant growth. In excessive amounts in a waterway, however, it can cause huge problems.

Nitrogen triggers algae blooms that strip waters of oxygen when the algae die and decompose, creating dead zones where oxygen levels are too low to support aquatic life.

As with mercury, steps have been taken to reduce airborne nitrogen. Catalytic

converters on cars greatly help control nitrogen emissions, but other trends have stymied nitrogen reductions. The number of cars and trucks on the road has grown dramatically over the past two decades. The number of miles people drive each year is up, and U.S. consumers have bought more SUVs and light trucks, which are not as strictly regulated.

"We are, more or less, now where we were in the mid-1970s," said Robert Howarth, the David Atkinson professor of ecology and environmental biology at Cornell University.

For the entire country, nitrogen input into rivers rose about 10 percent between 1980 and 2000, he said.

Howarth's research has identified one source of the pollutant in the atmosphere: the catalytic converters. Intended to reduce smog pollution, catalytic converters reduce most oxidized nitrogen gases to a harmless form of nitrogen, but some is reduced all the way to ammonia. Ammonia is a form of nitrogen, and it has been showing up near highways, where it washes into rivers.

Many U.S. rivers carry elevated amounts of nitrogen and are blamed for serious pollution problems in many coastal waters, including Long Island Sound, the Chesapeake Bay, the Gulf of Mexico and San Francisco Bay.

"In the U.S., two-thirds of the coastal bays and coastal rivers are degraded with nitrogen pollution," Howarth said.

On rivers such as the Mississippi, the nitrogen pours into the waterway from the agricultural lands of the Midwest. But on many other rivers, including the Connecticut, the nitrogen arrives airborne.

Because pollutants such as mercury and nitrogen continue to be a problem, researchers from the universities of Connecticut, Massachusetts, New Hampshire and Vermont formed the Connecticut River Airshed Watershed Consortium to coordinate studies aimed at determining exactly how such pollutants move about in the environment. Knowing that, they say, it will be much easier to devise ways to lessen the impact of the pollutants.

As for the mercury in game fish, "it really upsets me," said Michael Chickering, the North Country field biologist for the Loon Preservation Committee, a program of the Audubon Society of New Hampshire. "They say you can have two or three meals of fish a month to be considered safe, and as somebody who'd rather eat it two or three times a week, it really turns my stomach."

"I'd like to see it go away," he said. "But it's going to take a long time."

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