Studies cite high levels of mercury

By Tim Wacker, Globe Correspondent | January 18, 2007

Areas of the Merrimack Valley have some of the highest mercury levels in the Northeast, and the environmental level of the toxin in New England, New York, and southeastern Canada is much higher than previously indicated, according to two new studies.

The studies, described by the authors as the most detailed to date, found that mercury levels were five times higher than federal estimates in some areas, including the Merrimack Valley. The scientists who wrote the studies said the findings suggest contamination could be even higher in certain areas, including Plum Island.

Using feathers and meat from fish and birds sampled throughout the region, the studies often found mercury levels in the animals that tested well over 0 .3 parts per million, the maximum level the Evironmental Protection Agency deems safe for human consumption.

"Some of the highest levels of mercury in animals we tested were found at Parker River" National Wildlife Refuge, said David Evers, one of the authors of the studies. "And that's just one of the hot spots we found."

Those "hot spots" -- attributed largely to power-plant emissions -- are the focus of both studies, which will be published in the journal Bioscience in February. Both are highly technical works, compiled into a more reader-friendly version called "Mercury Matters." That version was published last week on a website run by the Hubbard Brook Research Foundation, based in Hanover, N.H., which helped finance the three-year project.

The first study, done by a team of 10 scientists led by Evers, an adjunct professor at the University of Southern Maine, is titled: "Biological Hot Spots in the Northeastern United States and Southeastern Canada." The second, by a team of eight scientists led by Charles Driscoll, a professor of environmental engineering systems at Syracuse University, is called "Mercury Contaminations in Forest and Freshwater Ecosystems in the Northeastern United States."

Together, they argue that taking a closer look at mercury contamination in the environment found that levels are much higher than EPA estimates, particularly in sensitive areas such as the Merrimack Valley.

According to both studies, mercury becomes dangerous to humans through eating animals such as fish and water fowl contaminated with methyl-mercury, a compound released into the environment by bacteria feeding on plants that absorb mercury through the air. Methyl-mercury is a known neurotoxin that can be dangerous to children and pregnant women.

Merrimack Valley lakes and rivers have long carried warnings about eating the fish they hold, but the Evers study notes that mercury is also bad for the birds and wildlife that feed there. The blood in one loon sampled in Barrington, N.H. --

about 20 miles northwest of Portsmouth -- had 7.1 parts per million, and at such levels, the birds can't raise healthy young, according to the studies.

These findings prompted the scientists involved to call for more studies to determine the extent of mercury contamination in areas susceptible to it. Those areas include reservoirs, former industrial sites, landfills, and any site near a coal-burning power plant.

Reservoirs accumulate more mercury than natural lakes and ponds through a complicated process related to water level fluctuations and increased plant matter, such as marsh grass, Driscoll said. It was a finding that anyone who lives near such a reservoir should know about, he added.

"We've done detailed studies that show this effect very clearly, and the Merrimack Valley has many, many such reservoirs," he said. "Fish collected from reservoir sites have much high levels of mercury contamination than those collected from lakes. As much as 50 percent higher."

Mercury also seeps into the Merrimack Valley from industrial sites and landfills leaching into rivers and streams through ground-water flow. But by far the biggest culprit is the power plants, according to the studies. The Merrimack Station Power Plant in Bow, N.H., near Concord, appears to be ground zero for heavy contamination found south and east of it, according to the studies.

"The overwhelmingly dominant input of mercury is from smokestacks," Evers said. "And the Merrimack Station Power Plant is a biggie in that regard."

The Merrimack station has plans in place to reduce mercury emissions from its smokestacks, according to Martin Murray, spokesman for Public Service of New Hampshire, which owns the facility.

State laws passed last year mandated that Merrimack remove 80 percent of the mercury it emits by 2013, and PSNH has a $250 million upgrade in place that will be ready on or before that time, Murray said. That system also is expected to remove 90 percent of the sulfur dioxide emitted, a key ingredient in acid rain.

The utility also is working this year with a $2.5 million federal grant to install a more experimental system, called a carbon injection system, that could remove 10 percent to 30 percent of the mercury in the plant's emissions.

"If the carbon injection system works, we will keep it up and running while the other system is being put into place," Murray said.

There is some good news to be gleaned from the studies. Both found mercury emissions overall have declined some 50 percent nationally since 1990. A federal ban on municipal and hospital trash incinerators is credited for the drop. Still, the presence of the hot spots and the prospect that emissions, while declining, were still being largely underreported are causes for concern, according to Evers and Driscoll.

The studies prompted US Senator Susan Collins of Maine to propose legislation to create a mercury hot spot monitoring network and to call for a revision of federal policy that allows mercury emissions of power plant smokestacks. Massachusetts and New Hampshire have passed laws that call for sharp cutbacks on smokestack emissions and other sources of mercury pollution.

However, some of those laws are still being implemented, and it's hoped by some local and state environmental groups that these studies will now make sure they are implemented aggressively.

"In the last five years, a lot of new regulations have been passed," said Elizabeth Saunders, the mercury campaign coordinator for Clean Water Action, a national advocacy group based in Boston. "But we're not seeing the effect of a lot of these policies because it remains to be seen if they are going to be aggressively implemented."

The Haverhill Environmental League has fought for years to get government more interested in cleaning up mercury in the Merrimack Valley.

Even a little bit of mercury is too much when it's going into the environment, said Brent Baeslack, the organization's executive director.

"Mercury is a fundamental element; it's not like it rots or degrades into anything else less dangerous," he said. "When you put mercury into the environment, it stays in the environment."■

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