Higher levels of mercury seen polluting region

By Beth Daley, Globe Staff | March 8, 2005

Mercury contamination is more pervasive in New England than researchers previously believed, according to a study being released today that indicates the toxic substance appears to be polluting the environment in ways that scientists previously did not think possible.

The four-year study in Northeastern United States and eastern Canada also indicates significant levels of mercury in forest songbirds and other animals that researchers did not suspect were ingesting mercury.

The study, comprising 21 papers being published in the journal Ecotoxicology, also identifies nine hot spots in the region, including in the lower Merrimack River area in Massachusetts and New Hampshire where mercury levels in animals such as brook trout, loons, mink, and eagles are alarmingly high. In some locations, the levels appear to be interfering with some species' reproduction.

"The impacts of mercury go well beyond what anyone would have envisioned yesterday," said Michael Bender, director of the Mercury Policy Project in Vermont and cochairman of the state mercury committee, who was not involved in the study. "It doesn't look like there are any limits on mercury's reach."

The $300,000 study, financed by the US Department of Agriculture's Northeastern States Research Cooperative, enlisted 50 scientists to analyze existing data of mercury in animals, soil, rivers, lakes, and streams. It also looked for the first time at mercury levels in such species as salamanders and songbirds in the region.

Mercury can damage the developing brains of fetuses and children and can cause a host of physiological and behavioral problems in wildlife. The naturally occurring element is released into the air by coal-fired power plants and eventually falls to land. The Northeastern areas of the United States and Canada have signifi- cantly cut mercury emissions. But mercury continues to drift from elsewhere in the country, and amounts harmful to humans and wildlife persist in the environment.

For years, scientists and public policy makers have focused on mercury that is emitted from power plants and incinerators and falls into lakes and ponds, where it is easily converted into its toxic form when it interacts with bacteria in freshwater sediment. Across the region, pregnant woman and children have been warned not to eat many freshwater fish because the creatures can pass on the mercury concentrated in their flesh.

But today's report indicates that the same type of toxic conversion may be happening on mountaintops and forests, with mercury falling out of the sky onto tree leaves and then dropping onto the moist forest floor.

Tiny insects then take up the mercury, and as insects are eaten by larger creatures the mercury accumulates in greater concentrations up the food chain, said David C. Evers, executive director of the BioDiversity Research Institute who helped conceive the research idea with Tom Clair, of Environment Canada, that country's environmental protection agency.

"These terrestrial systems have been completely overlooked," said Evers, who wants far more monitoring of the environment. "It's a complicated story, and we don't have all the answers yet."

The scientists found elevated mercury levels in Bicknell's thrushes, a small, forest bird with a distinctive song. In one instance, a Northern waterthrush from the Sudbury River in Massachusetts was found to have mercury levels higher than each of 100 juvenile bald eagles tested. Eagles, at the top of the food chain, can have signi ficant mercury levels presumably because their diet includes fish. Thrushes like to eat insects.

High concentrations of mercury in salamanders were found in Acadia National Park.

Mink and otter in Massachusetts and Connecticut, which have historically been tested for mercury, continued to show levels in their fur that are known to harm their health, although the levels have declined in recent years.

Scientists are just now beginning to document mercury's impact on the songbirds and salamanders because those creatures have not been widely studied. However, based on what they know about aquatic species such as loons, they say there could be ecological health effects. Loons in Maine and New Hampshire with high mercury levels have 40 percent fewer young than those with less mercury, according to previous research by Evers.

The hot spots in the Northeast include the Rangely Lakes Region, Upper Penobscot River watershed, and parts of midcoast and Down East Maine, all of which are home to otter, mink, brook trout, yellow perch, bald eagle, and the common loon whose mercury levels already exceed safe levels.

Hot spots were generally de- fined as areas with two or more species that had mercury levels above known thresholds for adverse health effects.

The study is being released as environmentalists press for federal mercury emission limits for coal, fire, and power plants. While the nine states, including Massachusetts, have or are attempting to put mercury controls in place, there are more than 100 new coal- fired power plants proposed in the United States, and environmentalists fear more mercury will be released into the environment.

"Wildlife is truly on the front line of the mercury contamination problem," said Felice Stadler, mercury policy specialist for the National Wildlife Federation. "This new research makes a compelling case for why we need to reduce mercury pollution today."

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