
ENVIRONMENTAL Fact Sheet



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Mercury: Sources, Transport, Deposition and Impacts

What you should know:

Mercury is a persistent, bioaccumulative, toxic pollutant. When released into the environment, it accumulates in water laid sediments where it converts into toxic methylmercury and enters the food chain. Mercury contamination is a significant public health and environmental problem because methylmercury easily enters the bloodstream and affects the brain. Due to decades of mercury deposition, mercury contamination in freshwater fish is widespread and significant enough to warrant fish consumption advisories in all 50 states. Mercury concentrations tend to be higher in larger, older fish and in fish from tea-colored and relatively acidic waters.

How does mercury get into the environment?

Mercury is introduced into the environment in three ways. First, mercury is emitted into the air naturally from volcanoes, the weathering of rocks, forest fires, and soils. Second, mercury is emitted into the air from the burning of fossil fuels and municipal or medical waste. Lastly, mercury can be re-introduced into the environment through natural processes such as evaporation of ocean water. According to the U.S. Environmental Protection Agency's 2014 National Emissions Inventory report, power plants that burn coal to create electricity are the largest source of emissions; they account for about 42% of all manmade mercury emissions. Mercury deposited in New Hampshire is both emitted from in-state sources and carried here primarily from coal-fired utilities and municipal and medical waste incinerators in the Northeast and Midwest.

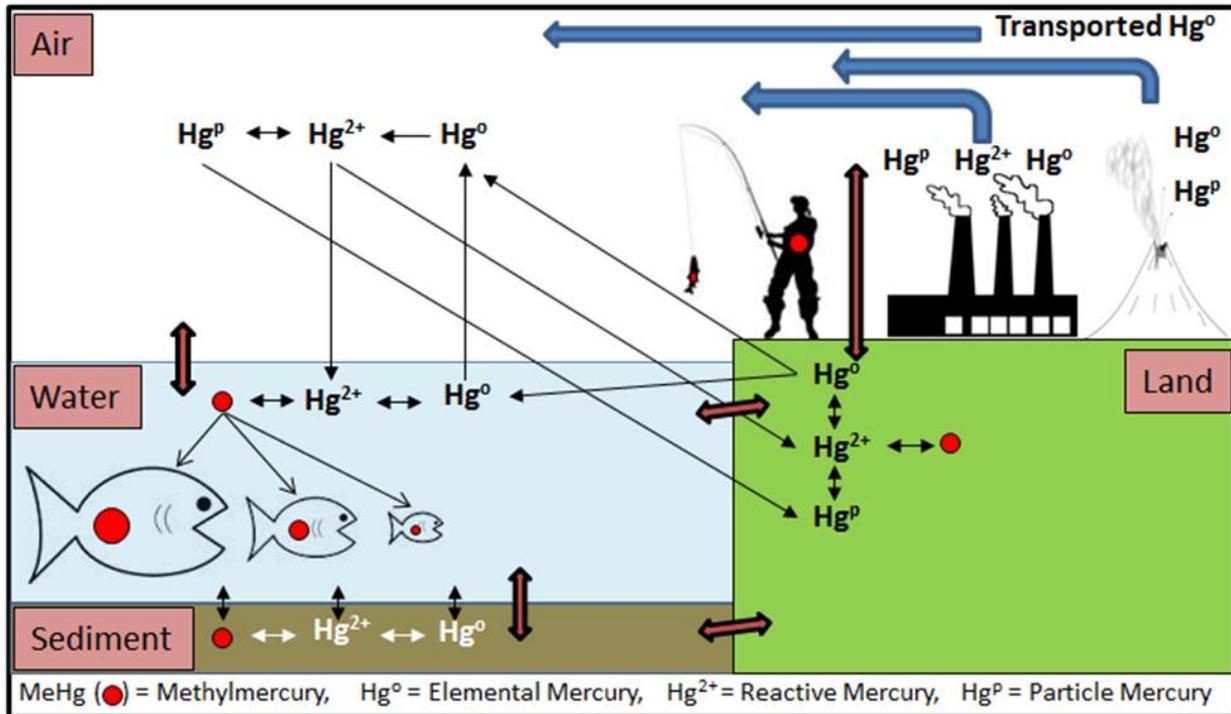


Once it is released into the atmosphere, mercury can travel hundreds of miles with the wind before being deposited on the earth's surface. Deposition can occur in as little as five to fourteen days after mercury is emitted to the air, or it can take approximately one year – during which time mercury can reside in the air and be transported far around the globe. Once deposited on the ground, mercury can be carried by rain and snowmelt runoff to the state's surface waters.

Mercury persists in the environment for long periods by cycling back and forth between the air and soil, all the while changing chemical forms. Atmospheric lifetimes of inorganic elemental mercury are estimated to be up to two years, while organic methylmercury may stay in the soils for decades. Mercury is never removed from the environment; it is just moved to other locations and eventually buried under soils and sediments.

Studies show that mercury deposition rates in New Hampshire, as in the entire Northeast, are higher than in other areas of the country due to the combination of local emissions and transport from upwind sources. The global mercury reservoir that has resulted over time from both natural and man-made sources also contributes to deposition in the Northeast.

Mercury Cycle in the Environment



What are the impacts on public health and the environment?

Health concerns in the United States center on human consumption of fish contaminated with methyl mercury.

Neurotoxicity is the most important health concern associated with mercury exposure. Methylmercury easily reaches the bloodstream and is distributed to all tissues, and can cross the normally protective blood-brain barrier and enter the brain. It can also readily move through the placenta to developing fetuses and their developing brains, and is therefore a particular concern to pregnant women and women of childbearing age.

Low-level exposure is linked to learning disabilities in children and interference with reproduction in fish-eating animals. Mercury exposure in humans can also lead to a variety of other negative health effects, including neurological, kidney, gastrointestinal, genetic, cardiovascular and developmental disorders, and even death. Because methylmercury inhibits the normal development of the nervous system in young children and fetuses, New Hampshire has developed water body specific fish advisory recommendations. These water body specific advisories can be found in fact sheet ARD-EHP-25.



In addition to the effect on humans, fish-consuming wildlife such as loons, eagles and otters are also at risk from mercury contamination. Reproductive problems are the primary concern for birds suffering from mercury poisoning. Other mercury effects in birds and mammals include liver damage, kidney damage, and neurobehavioral effects.

What is being done to reduce the release of mercury to the environment?

To address these concerns, New Hampshire's *Mercury Reduction Strategy* was released in October 1998. The Strategy contained 40 recommended actions for reducing man-made releases of mercury to the

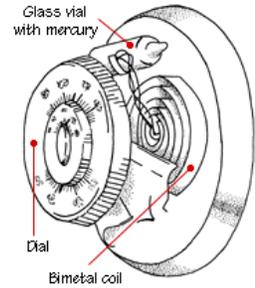
environment and contained a goal of 50% reduction in mercury emissions by December 2003, with an overall goal of the virtual elimination of anthropogenic mercury releases.

The focus of New Hampshire Department of Environmental Services (NHDES) activities included (1) legislative efforts to reduce mercury in consumer and commercial products; (2) outreach to users of mercury and mercury devices, such as hospitals, schools, and dentists; (3) an initiative that focused on motor vehicle salvage facilities and the removal and recycling of mercury-added convenience lighting switches prior to vehicle crushing; and (4) the adoption of rules that require dentists to install amalgam separators with a 99% removal efficiency.



NHDES has completed all its projects contained in the strategy to

address mercury reduction and has documented reductions in mercury emissions of 97% from 1997 to 2014.



NHDES continues to conduct education and outreach activities on mercury hazards, alternatives to mercury containing products, and methods to reduce the release of mercury to the environment. For more information on mercury in the environment, contact the NHDES Pollution Prevention Coordinator at (603) 271-6398.