N.H. Sea Grant

UNH Researchers Study Gulf of Maine Mercury Contamination

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DURHAM, N.H. -- Mercury is presently the most high profile contaminant in the Gulf of Maine. The elimination of its sources has been the subject of meetings of the governors and organizational leaders of each of the five jurisdictions around the gulf.

One of the world's most productive marine ecosystems, the Gulf of Maine is home to a collection of distinct and economically important species. The Gulf of Maine extends from Cape Sable, Nova Scotia, to Cape Cod, Mass. Organizations such as N.H. Sea Grant, the Gulf of Maine Council on the Marine Environment, and the Regional Association for Research in the Gulf of Maine have developed action plans and support initiatives focusing on mercury and other trace metal pollution.

Two University of New Hampshire researchers, geochemist Henri Gaudette and microbiologist Steve Jones, are studying the extent and impact of mercury contamination in the Penobscot River watershed following numerous leaks and spills in the area.

"Declining stocks of wild populations of fish, the loss of critical estuarine and coastal habitats, and the threat of nonpoint sources of pollution are signs that the marine environment has been degraded," says Jones. "It is crucial for us to understand the impacts of our actions, as environmental degradation is detrimental not only to the health of our ecosystem, but also to the economic and social well-being of coastal communities."

Jones and Gaudette are focusing on two sites in the watershed. The first site, located in Orrington on the Penobscot River, is a freshwater environment, while the second, at Stonington Harbor, is saltwater. "This project

is important because you have two very different marine environments, which makes it ideal to study and compare the mechanisms of mercury contamination," Gaudette explains.

The project, which is funded by N.H. Sea Grant, will determine the distribution of mercury contamination in surface sediments and establish the historical chronology of mercury deposition and burial at both sites.

While numerous studies have documented the distribution of trace metals in sediments in various areas of the gulf, resource managers need to know the sources so that the discharge of contaminants of concern to the environment can be eliminated. The source or source area is know at both study areas, which is useful for determining the fate of the mercury in the environment. The study results will aid researchers in determining the sources and fate of mercury elsewhere in the marine environment.

Jones says that bacteria in the sediment transform the mercury into an even more toxic form, mono-methyl mercury. This form bioaccumulates, moving up through the food chain. This poses health risks to the marine environment and seafood consumers alike.

Jones and Gaudette place blue mussels from clean areas of Penobscot Bay into containment structures in the contaminated areas, so that they can study the accumulation of mercury in mussel tissue over time. The pair also plans to investigate impacts of the mercury to indigenous biota by looking at changes in bacterial resistance to mercury.

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