

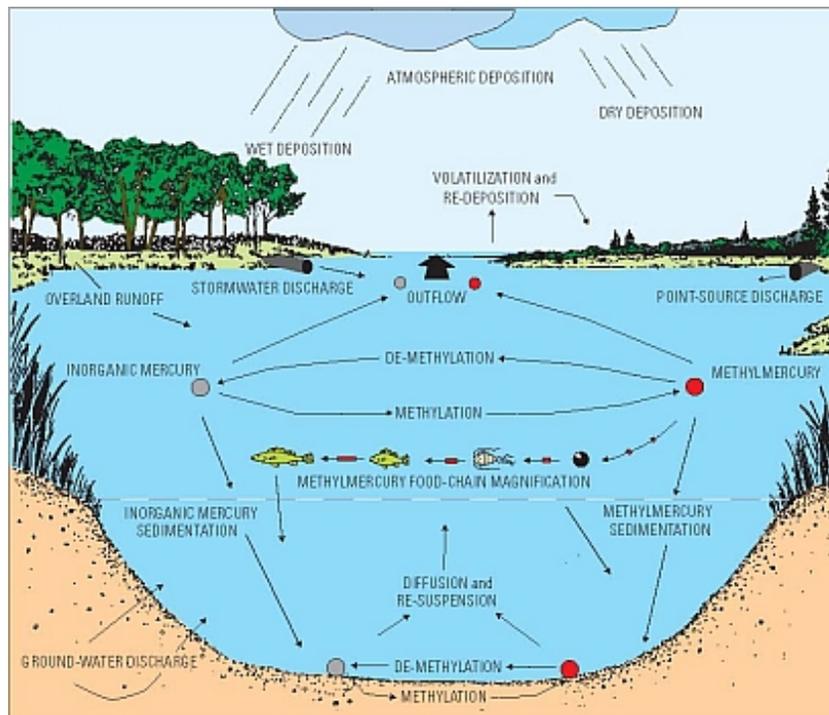


INVESTIGATIONS AND MONITORING OF MERCURY IN INDIANA BY THE U.S. GEOLOGICAL SURVEY

Mercury is a persistent toxic pollutant that poses a risk to humans and wildlife, primarily through fish consumption. Small concentrations of inorganic mercury in precipitation, dry atmospheric deposition, and wastewater discharges that enter aquatic ecosystems can be converted to organic methylmercury. Methylmercury accumulates in the food chains of aquatic ecosystems and magnifies in concentration so that mammals (including humans) and birds at the top of the food chain can be exposed to methylmercury concentrations that pose a health risk. The primary health risks are to the brain and nervous systems, especially for the young and unborn.

Mercury has been detected in nearly all fish-tissue samples collected in Indiana since 1983. Concentrations of mercury in some tissue samples from fish caught in Indiana waters have prompted State health officials to issue advisories that warn about human consumption of these fish. These advisories apply statewide to certain sizes and species of fish and include additional warnings for specific streams and lakes.

In 2004, mercury advisories affected 3,033 mi of streams, 57,999 acres of lakes, and 59 mi of Great Lakes shoreline in Indiana. Each year, some 833,000 resident anglers, 16 years and older, spend 15.5 million days and \$469 million for fishing as recreation. An estimated 286,000 more resident anglers are 6 to 15 years old. Based on these numbers, fish-consumption advisories affect approximately 1 of 6 Indiana residents.



The Mercury Cycle in Aquatic Ecosystems

Methylmercury is produced from inorganic mercury by a microbial process that occurs under certain conditions in aquatic ecosystems. Fish living in aquatic ecosystems with low concentrations of inorganic mercury are known to accumulate methylmercury in their tissue. Concentrations of methylmercury can increase up the food chain so that higher-level organisms tend to accumulate the highest levels of methylmercury.

Monitoring of Mercury in Indiana

The U.S. Geological Survey (USGS) in cooperation with the Indiana Department of Environmental Management (IDEM) has operated statewide monitoring networks for assessing mercury concentrations and loads in streams since 2002, and mercury concentrations and deposition from precipitation since 2001. In addition, IDEM has maintained annual fish sampling for mercury since 1993 in support of health-risk-fish-consumption advisories.



Mercury in precipitation has been monitored by USGS in cooperation with IDEM since 2001. Weekly composite samples are collected from five stations across Indiana. The monitoring stations are part of the National Atmospheric Deposition Program Mercury Deposition Network, that operated 100 monitoring stations in North America in 2007.



Atmospheric mercury species were measured with a manual air sampling system at three stations in Indiana in 2004. Samples were analyzed in a laboratory and concentrations were used to estimate mercury dry deposition.



Mercury in streams in Indiana has been monitored by the USGS since 2004, following a program by IDEM from 2002 to 2004. The monitoring network includes 25 stations at USGS streamgages and samples are collected on a quarterly schedule. The monitoring stations include streams with watersheds representing 80 percent of the land area in the State, and range in size from 59 square miles to 13,756 square miles.



Low-level mercury sample collection, sample processing, and analysis are done using ultra-clean methods to avoid introducing unintended contaminants into samples. Analytical methods quantify mercury concentrations as small as 0.05 nanograms per liter (parts per trillion).

Mercury in Precipitation in Indiana

Mercury in Precipitation Monitoring Program Description

- [Read the fact sheet in HTML format](#)
- [Download the fact sheet in PDF format](#)

Data Summary for January 2001 through December 2005

- [Download the summary in PDF format](#)

Mercury in Precipitation in Indiana, January 2001--December 2003, U.S. Geological Survey Scientific Investigations Report 2007-5063 by Martin R. Risch

- [Read the Abstract of this report in HTML format](#)
- [Download the report in PDF format 6.45 megabytes](#)

Atmospheric Mercury in Indiana

Measurement of Atmospheric Mercury Species with Manual Sampling and Analysis Methods in a Case Study in Indiana by Martin R. Risch, Eric M. Prestbo, and Lucas Hawkins

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Mercury in Indiana Streams

Mercury in Indiana Streams Monitoring Program Description

- Read the fact sheet in HTML format (under Construction)
- Download the fact sheet in PDF format (under Construction)

Water-quality characteristics and mercury concentrations in water samples from stream-monitoring network in Indiana, August 2004 through June 2005 by Martin R. Risch in U.S. Geological Survey Water Resources Data Indiana Water Year 2005 by Scott E. Morlock, Hieu T. Nguyen and Deborah K. Majors, Water-Data Report IN-05-1, pages 483-490

- [Read the data report in PDF format](#)

Water-quality characteristics and mercury concentrations in water samples from stream-monitoring network in Indiana, September 2005 through September 2006 by Martin R. Risch

- [Read the data report in PDF format](#)

Mercury in the Grand Calumet River/Indiana Harbor Canal and Lake Michigan, Lake County, Indiana, August 2001 and May 2002, U.S. Geological Survey Scientific Investigations Report 2005-5034 by Martin R. Risch

- [Read the Abstract of this report in HTML format](#)
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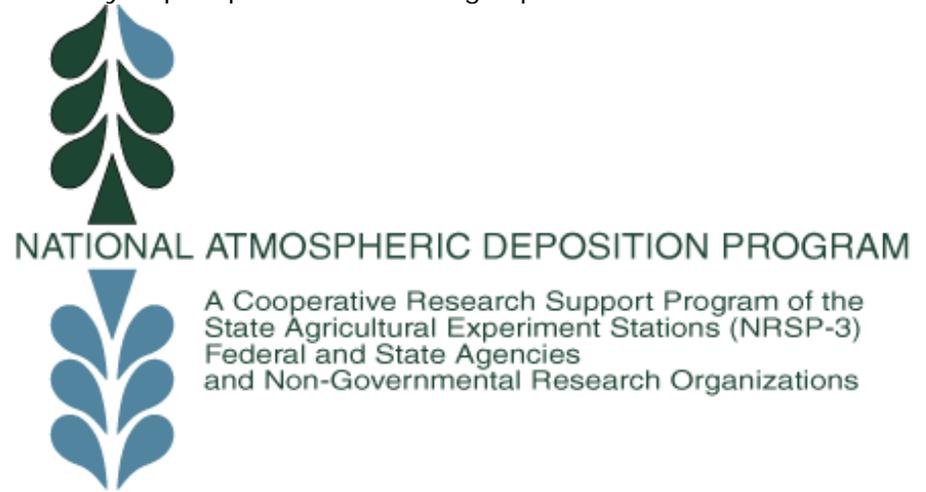
More mercury information from the USGS at <http://toxics.usgs.gov/investigations/mercury.html>

More mercury information from the IDEM at http://www.in.gov/idem/your_environment/mercury/

Mercury monitoring in cooperation with



Mercury in precipitation monitoring is part of



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