

**One Gram of Mercury Can Contaminate a Twenty Acre Lake: An Clarification of This
Commonly Cited Statistic**

Summary Prepared by IMERC Staff
2004

The Interstate Mercury Education and Reduction Clearinghouse (IMERC) staff has investigated the basis for the commonly-used phrase, “one gram of mercury can contaminate a twenty acre lake.” This material presented below summarizes the findings of this research. Variations of this analogy have been used to illustrate the concept that relatively small quantities of mercury can result in contamination of lakes and streams. The origin of this analogy was a 1995 brochure produced by a joint program in Minnesota, Michigan, and Wisconsin. The pertinent section of this brochure states: “About a gram of mercury enters a 20-acre lake each year. A gram of mercury is only a small drop....Even these small amounts of mercury in lake water can contaminate the fish, making them unfit to eat on a regular basis.”¹

The figure of one gram per 20-acre lake is based on a 1992 study by the Minnesota Pollution Control Agency that found that virtually all of the mercury in Minnesota lakes is the result of atmospheric deposition (through precipitation and dry deposition on particulate matter), at a rate of 12.5 micrograms per square meter per year.² Other studies have found similar deposition rates. This deposition rate corresponds to about one gram (the average amount of mercury in a fever thermometer) deposited in a twenty acre lake every year. As evidenced by fish consumption advisories due to mercury in over 40 states, over time, this seemingly small annual atmospheric deposition often results in mercury-contaminated fish that are unsafe to consume on a regular basis. The exact level of fish contamination varies because of variations in many factors including: watershed size, lake depth, primary productivity, food chain characteristics, presence of wetland areas, and mercury methylation rates.

The analogy has sometimes been oversimplified to infer that spilling a gram of liquid mercury from a fever thermometer into a lake could result in the same degree of fish contamination as annual atmospheric deposition of the same amount. Although a spilled gram of liquid mercury could volatilize and return to earth dissolved in rain, liquid mercury directly poured into a lake would not contaminate fish as efficiently as the same amount of mercury in rain or other forms of atmospheric deposition.

A more exact summary of the information would be: “Approximately one gram of mercury, the amount in a single fever thermometer, is deposited to a 20-acre lake each year from the atmosphere. This small amount, over time, can contaminate the fish in that lake.”

¹ Minnesota Pollution Control Agency, Michigan Department of Natural Resources, Wisconsin Department of Natural Resources, (grant from U.S. Environmental Protection Agency), “Mercury in the Environment: The Waste Connection,” 1995, <http://www.epa.gov/grtlakes/p2/mercpam.html> (on-line version, 1997).

² Swain, E.B., et. al., 1992, “Increasing Rates of Atmospheric Mercury Deposition in Midcontinental North America”, *Science*, 257: 784-787.