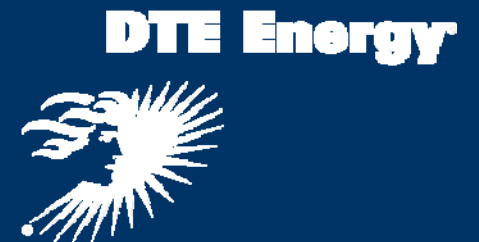




Need for Clarification on Mercury Policies

December 2006



Needed Clarifications on EPA's Mercury Policies in the Great Lakes



- **Do the Great Lakes have acceptable mercury concentrations?**
- **If not, where are the impairments and what are the causes?**
- **Which solutions are being advocated and are these solutions reasonably linked to the impairments?**
- **Is there merit in a basin-wide conference to address some of these issues?**



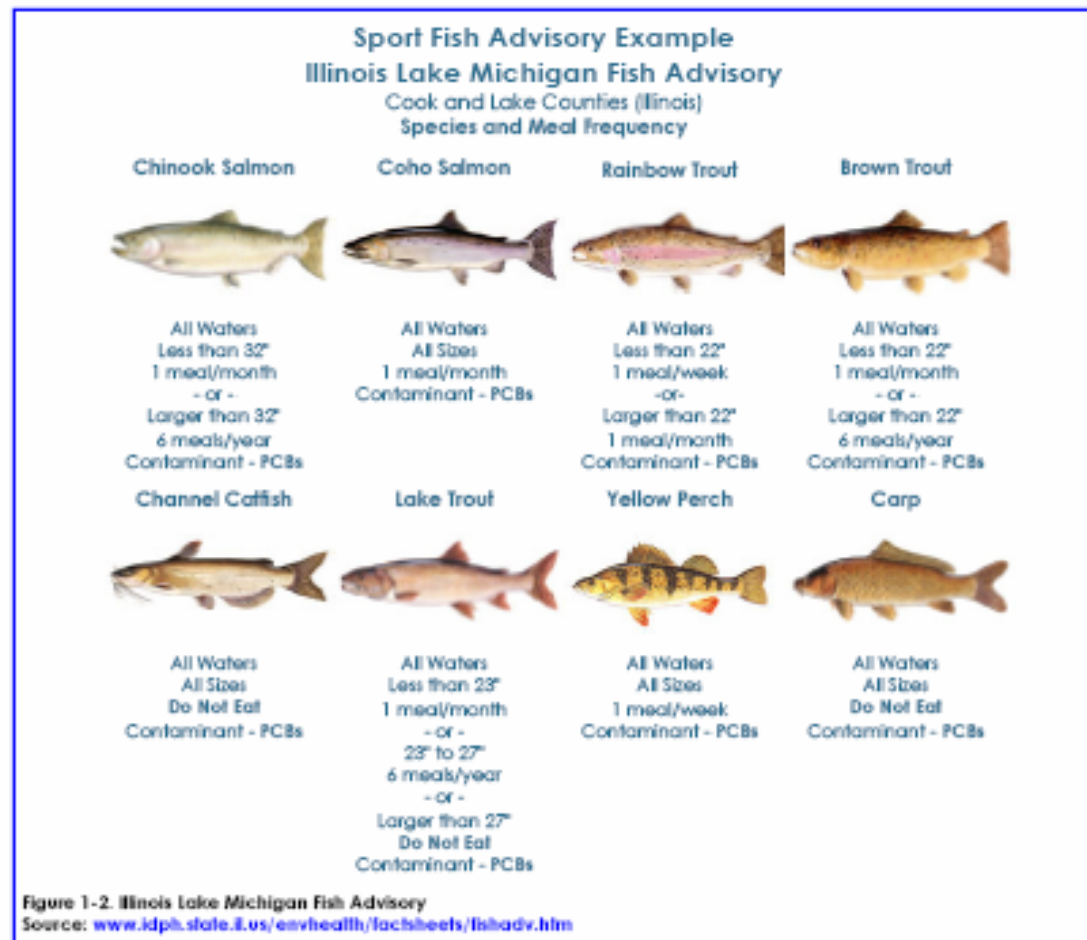
Some Acceptability Issues

- **Fish advisories are used inconsistently**
- **PCB contamination is confused with Mercury contamination**
- **Isolated problems in areas of concern are confused with the acceptability of open water mercury concentrations**



Sport Fish Advisory Example

1-4





Clarification Needed on Acceptable Mercury Concentrations

- **Water column versus fish tissue**
- **Individual species versus geometric mean**



Are Fish Tissue Concentrations More Important than Water Column Concentrations?

- **If fish in a water body meet EPA's fish tissue quality, should the water column concentrations be a concern?**
- **Can the GLI BAF methodology, which is predicated on steady state conditions be used to translate fish tissue standards into an acceptable water column value? Note that steady state conditions do not exist.**



Does Lake Michigan have Acceptable Mercury Concentrations?

In the 2006 Lake Michigan LAMP EPA says,

“Mercury is emerging as a growing concern in Lake Michigan” (p. 5 Chapter 1)

But...EPA’s Mercury Maps portrays Lake Michigan as okay.

Are Acceptable Fish Tissue Concentrations Determined by Looking at Individual Fish Species or by Looking at the Geometric Mean?



Many state 303d lists and RAPs have water bodies as impaired when only a single, fish species representing the highest trophic levels exceeds a criteria, but EPA recommends that the geometric mean of ALL fish species be utilized (pp 18 and 19 of Section VIII of Supplementary Information Document of the GLI).

EPA Itself is Inconsistent on Whether the Criteria is Individual Species or a Geometric Mean



Mercury concentrations in adult lake trout ranged as high as 396 ng/g and averaged 139 ng/g. In coho salmon, mercury concentrations ranged as high as 127 ng/g and averaged 79.9, 20.6, and 69.0 ng/g in hatchery, yearling, and adult salmon, respectively....Most Lake Michigan lake trout and coho salmon exceed the EPA guidelines for unrestricted consumption.

Source: EPA 2006 Lake Michigan LAMP

Mercury concentrations in fish averaged 139 ng/g in lake trout and 69.0 ng/g in adult coho salmon. **These average values are approximately 10 times below the U.S. Food and Drug Administration's (FDA) action level of 1000 ng/g (1 ppm) for fish tissue mercury content.** Even the maximum mercury concentration measured in the LMMB Study (396 ng/g) was well below the FDA action level. However, EPA guidance for fish advisories is based on the methylmercury content of fish, and methylmercury was not measured in fish in the LMMB Study. Therefore, the data from this study are not readily comparable to the EPA guidance. However, based on the conservative assumption that 100% of total mercury was in the form of methylmercury, 3% and 9% of lake trout and coho salmon, respectively, fell into the unrestricted consumption category established in the EPA guidance for methylmercury.

Source: EPA 2004 Lake Michigan LAMP



What is the Acceptable Mercury Concentration in an NPDES Discharge?

- **What is the wildlife standard?**
- **How does waste load allocations translate into NPDES limits?**



The Current GLI Open Water Standard Considers Both Toxicity to Humans and Wildlife

The wildlife value is about 3 times lower than the human health standard. The wildlife is the lowest value determined for three (3) different wildlife classes namely birds, mammals and amphibians. The present bird value is out of date and in need of revision. If appropriately revised using more current EPA science, the new wildlife standard would be about twice as high.



Translating Waste Load Allocations into Discharge Limits

- The open water concentration for mercury are the result of both mercury inputs (atmospheric deposition, point and non-point sources, and sediments) and outputs (chiefly evasion back to the atmosphere). Evasion is about one half of the total input. In other words if the average incoming mercury concentration were 2 parts per trillion, the average open water concentration would be about 1 part per trillion. The Supplementary Information Document to the Water Quality Guidance for the Great Lakes states "...volatilization losses can be considered when setting TMDL's, Waste Load Allocations in the absence of TMDL's and preliminary waste load allocations for the purposes of determining the need for Water Quality Based Effluent Limits." Page 48, Section VIII, March 1995.
- If volatilization reduces mercury concentrations in two and if they are allowed in Waste Load Allocations, then shouldn't NPDES discharge values be two-fold higher?



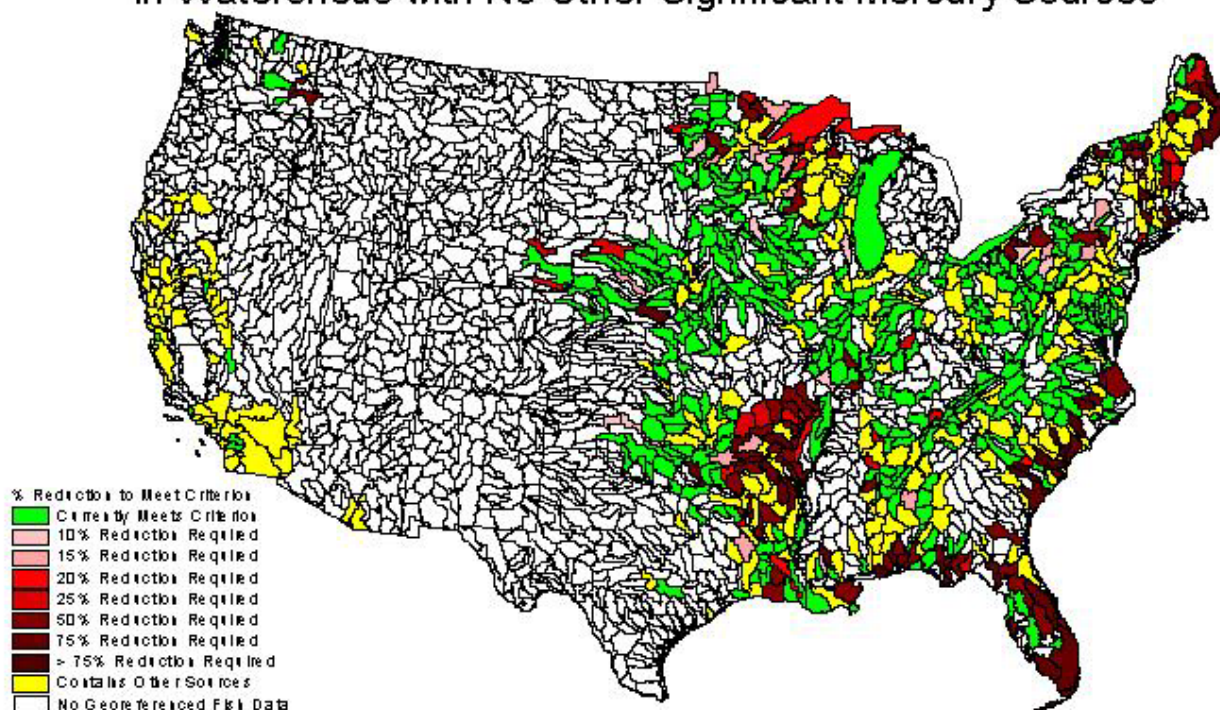
Considering All of the Above, the Vast Majority of the Great Lakes Fishery Meets EPA's Criteria

Lake Superior is an exception, as are a limited number of tributaries and harbors that have been impacted by contaminated sediments from historical releases.



Mercury Maps – National Application

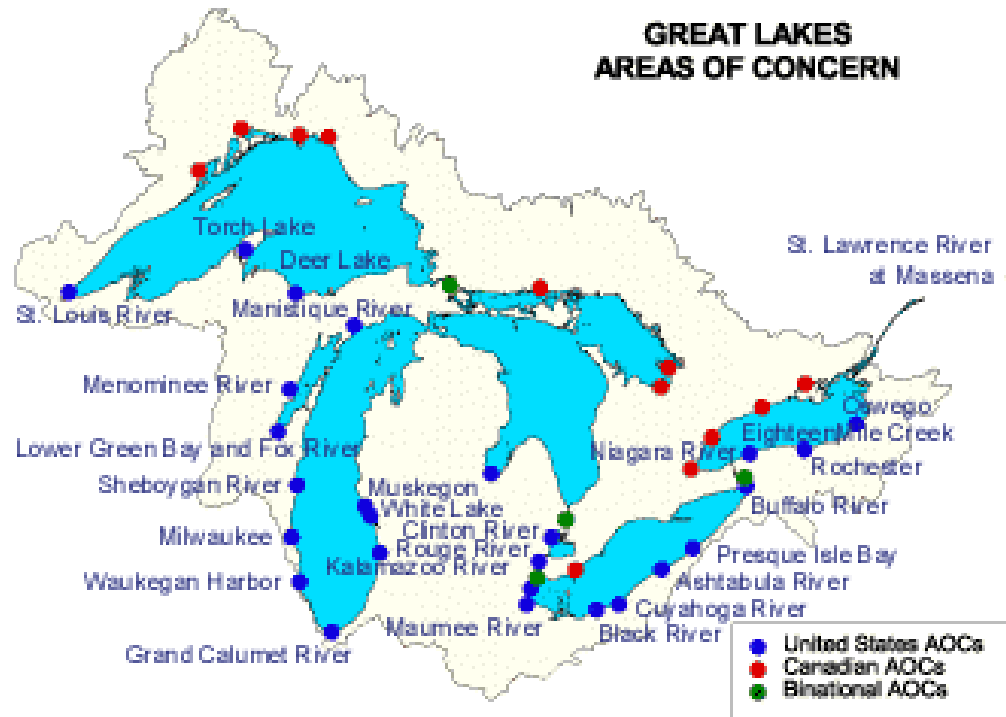
Estimated Percent Reductions in Air Deposition Load
Necessary to Meet New Methylmercury Criterion
In Watersheds with No Other Significant Mercury Sources



Note: Additional reductions would be required to meet EPA national and most state fish advisory levels, which are often set below the methyl-mercury criterion. Watersheds highlighted yellow have significant non-air-deposition mercury sources, defined as where the total estimated load from Publicly Owned Treatment Works (POTWs) and pulp and paper mills is greater than 5% of estimated waterbody delivered mercury at a typical air deposition load (10 g/km²/yr), and/or where mercury cell chlor-alkali facilities, mercury mines, or significant past producer gold mines are present. See text of report for data sources for point source dischargers and mines.

Source: National Listing of Fish and Wildlife Advisories (NLFWA) Mercury Fish Tissue Database (June, 2001).

Great Lakes Areas of Concern



Sediments have been identified as serious problems in many AOCs.



Present EPA Initiatives Consider

- **Reducing atmospheric emissions and thereby some of the atmospheric deposition**
- **Broad reductions in the use of mercury**
- **Remediation of contaminated sediments**

Are these solutions reasonably linked to the impairments?

EPA's Understanding of Atmospheric Deposition (see attached figure)

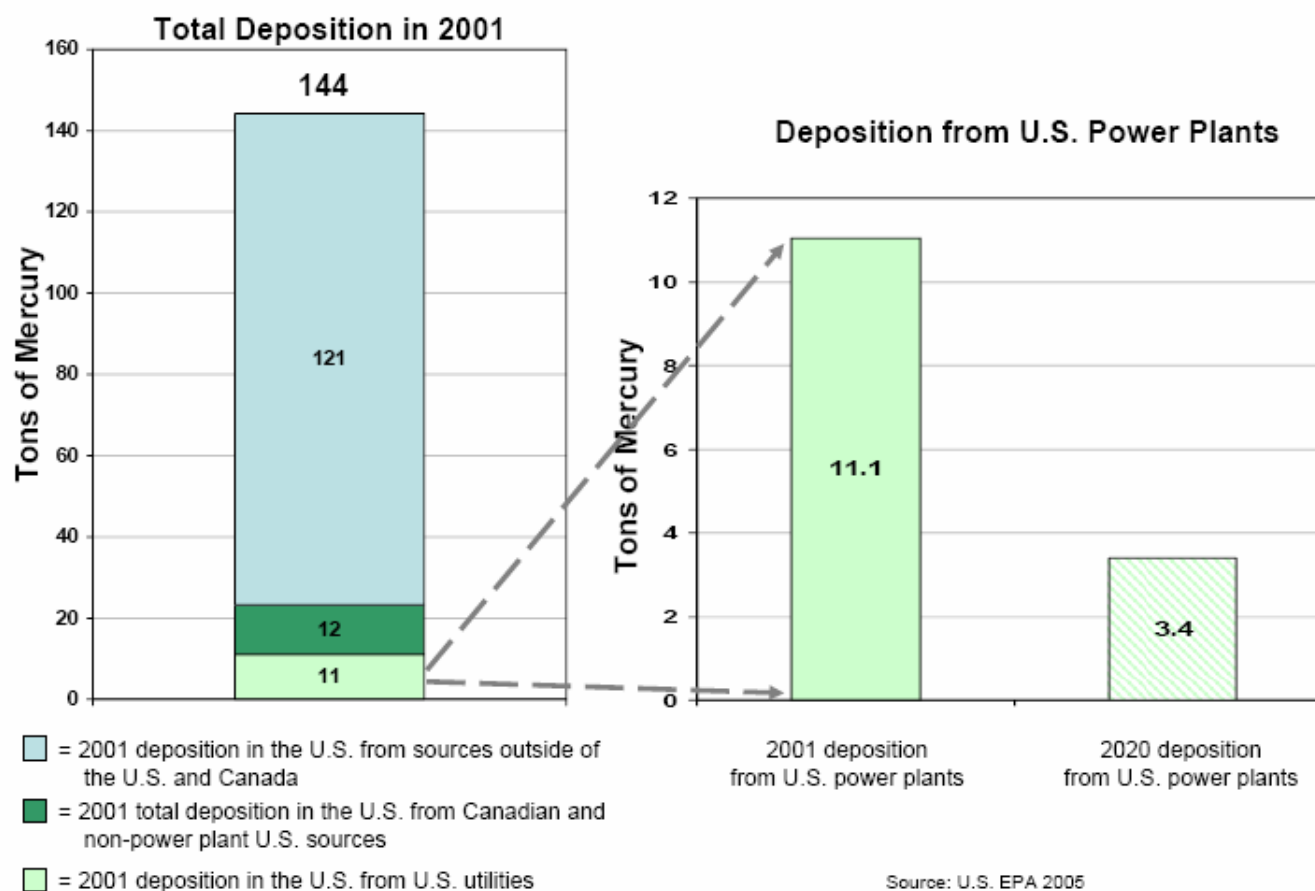


- **Little mercury deposition today is from U.S. sources**
- **In 2020 there will be exceedingly little deposition from U.S. sources**
- **Why is GLNPO seeking further restrictions in mercury use and U.S. emissions?**



Mercury Deposition in the U.S.

Mercury Deposition in the U.S.





Conclusion

- **Which solutions are being advocated and are these solutions reasonably linked to the impairments?**
- **Is there merit in a basin-wide conference to address some of these issues?**