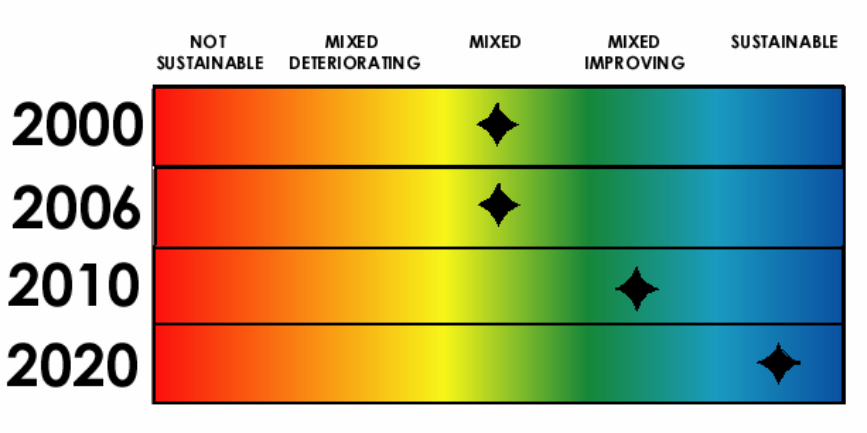
Subgoal 1
Can we all eat any fish?

Status

Commercial and sport fishing are important to a sustainable Lake Michigan. The need still exists for all four Lake Michigan states to maintain advisories to warn the public about potential health effects resulting from consuming certain species of sport fish in the lake as well as inland lakes. In 2004, the FDA and USEPA issued AN advisory for Women Who Might Become Pregnant, Women Who are Pregnant, Nursing Mothers, and Young Children concerning levels of mercury in commercial fish (See www.cfsan.fda.gov~dms/admehg3.html for more information). As a result, achievement of the subgoal in Lake Michigan is mixed.

Lake Michigan Target Dates for Sustainability



Indicators (State of the Lakes Ecosystem Indicators by Number)

- 114 - Contaminants in Young-of Year Spottail Shiners
- 117 - Atmospheric Deposition of Toxic Chemicals
- 118 - Toxic Chemical Concentrations in Offshore Waters
- 119 - Concentrations of Contaminants in Sediment Cores
- 124 - External Anomaly Prevalence Index for Nearshore Fish
- 4177 - Biological Markers of Human Exposure
- 4201 - Contaminants in Sport Fish
- 8135 - Contaminants Affecting Productivity of Bald Eagles

Challenges

- Determine and reduce the source of toxic atmospheric deposition to Lake Michigan
- Uniform fish consumption advice for Lake Michigan
- Secure resources to clean up contaminated sediment sites
- Make fish consumption advisory data widely accessible and user-friendly using multiple languages
- Maintain the health and sustainability of the aquatic food web in Lake Michigan as well as continue the progress of making fish safe to eat.

Next Steps

- Develop the Impaired Waters Strategy
- Clarify common definition of “open waters”
- Cleanup of superfund sites and other PCB contaminated harbors
- Support efforts to recycle mercury-containing electronic devices

Fish Consumption Advisories

Consumers should know that fish and shellfish can be important parts of a healthy and balanced diet. They are good sources of high quality protein and other essential nutrients. Women of child-bearing age, fetuses, and children are more susceptible to the effects of contaminants in fish. State fish consumption advisories include advice specifically targeted to these sensitive populations.

Fishing is one of the most popular forms of outdoor recreation in the Midwest, and Americans are eating more fish as diets shift toward more low-fat foods.

About 40 species of fish currently inhabit Lake Michigan, most of which are native to the lake. Over 43 percent of all Great Lakes fishing in the U.S. is done in Lake Michigan, and both commercial fishing and sport fishing are significant contributors to the economies of the states in the basin. Commercial fish production (both nontribal and tribal) reaches over 14.6 million pounds of fish annually. The commercial fishery is valued at more than $270 million and the recreational fishery at $4 billion.

Fish consumption, however, has been shown to be a major pathway of human as well as wildlife exposure to persistent toxic substances, such as polychlorinated biphenyls (PCBs) and mercury. Contaminants released from many sources are transported through the environment and are carried into streams and lakes. Small organisms absorb these contaminants and are, in turn, eaten by other organisms and small fish. Some of these contaminants bioaccumulate in the fish –and in humans who eat them – to levels that can pose health risks.

Great Lakes Regional Collaboration Action Items

Persistent Bioaccumulative Toxic Pollution

Toxic pollutants continue to stress the Great Lakes ecosystem, posing threats to human and wildlife health. Persistent toxic substances such as mercury and PCBs remain present in fish at levels that warrant advisories and restrict consumption throughout the Basin. To address this ongoing problem, actions are needed to:

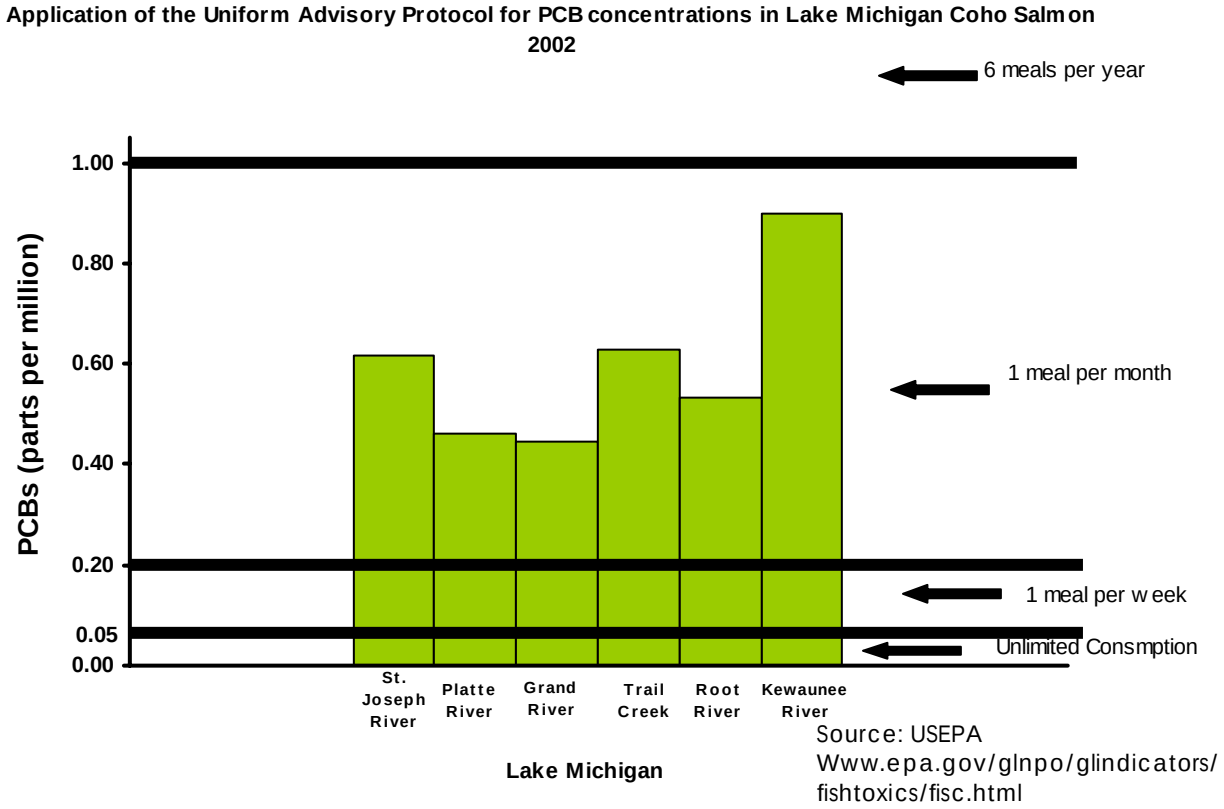
- reduce and virtually eliminate the discharge of mercury, PCBs, dioxins, pesticides and other toxic substances to the Great Lakes;
- prevent new toxic substances from entering the Great Lakes;
- institute a comprehensive research, surveillance and forecasting capability;
- create consistent, accessible basin-wide messages on fish consumption and toxic reduction methods and choices; and
- support efforts to reduce continental and global sources of toxics to the Great Lakes.

State fish consumption advisories are issued to protect people from potential adverse health effects associated with contaminants found in fish. These advisories recommend amounts and types of fish that are safe to eat. Fish consumption advisories may also include information to educate the public on how to

The Lake Michigan Toolbox
State Fish Consumption Advisories

Illinois: www.idph.state.il.us/envhealth/factsheets/fishadv.htm
Indiana: www.in.gov/isdh/programs/environmental/fa_links.htm
Michigan: www.michigan.gov/mdch/0,1607,7-132--13110--,00.html
Wisconsin: http://dhfs.wisconsin.gov/eh/fish/

A consolidated source for Great Lakes fish consumption advisories as well as information on other standards applicable to the lakes is available on a Great Lakes Information Network site:
http://www.great-lakes.net/envt/flora-fauna/wildlife/fishadv.html



minimize exposure to certain contaminants through proper fish preparation and cooking. The advisories are viewed as a temporary measure to protect the public while control measures and site cleanups reduce contamination to safe levels.

PCBs are the primary contaminant behind the fish consumption advisories published by all four Lake Michigan states. There are also advisories for dioxin, chlordane, DDT, and mercury (See Appendix A for more detailed information). Mercury advisories are also issued by each Lake Michigan state for fish of inland lakes and some select Lake Michigan sites. As a rule, mercury is the dominant contaminant behind fish consumption advice from inland lakes due to atmospheric deposition and the lack of elimination of water through streams and or rivers. Dioxins, chlordane, and DDT and many other contaminants are also present in fish but are not in high enough quantity to warrant advice beyond PCB levels.

States frequently use fish consumption advisories (See opposite page) as indicators of whether their waters are meeting designated uses, triggering the need for investigation and setting a total maximum daily load (TMDL) for contaminants. TMDLs for PCB and mercury are therefore required for Lake Michigan. The fish consumption advisories are updated annually and updated on state fish consumption advisory web pages. Locations of specific needed TMDLs related to fish advisories are listed in the watershed fact sheets (See Chapter 12).

PCB Advisories

PCBs are a group of more than 200 similar man-made chemicals that were used in a variety of industrial applications as insulating fluid for electrical equipment like capacitors and transformers. They are oily liquids or solids, clear to yellow in color, with no smell or taste. More than 1 billion pounds of PCBs were manufactured in the United States. Because of the health effects associated with exposure, commercial production of PCBs ended in 1977. In 1979, the U.S. Environmental Protection Agency (USEPA) also banned most uses of PCBs; however, PCB removal or replacement was not required for equipment that already contained these chemicals and was in a closed system. PCBs are still present in many products made prior to 1979. Because these contaminants were used so widely and take a long time to break down, they can be found in the fat of people and animals.

Sport Fish Advisory Example
Illinois Lake Michigan Fish Advisory

Cook and Lake Counties (Illinois)

Species and Meal Frequency

Chinook Salmon

All Waters
Less than 32"
1 meal/month
- or -
Larger than 32"
6 meals/year
Contaminant - **PCBs**

Coho Salmon

All Waters
All Sizes
1 meal/month
Contaminant - **PCBs**

Rainbow Trout

All Waters
Less than 22"
1 meal/week
-or-
Larger than 22"
1 meal/month
Contaminant - **PCBs**

Brown Trout

All Waters
Less than 22"
1 meal/month
- or -
Larger than 22"
6 meals/year
Contaminant - **PCBs**

Channel Catfish

All Waters
All Sizes
Do Not Eat
Contaminant - **PCBs**

Lake Trout

All Waters
Less than 23"
1 meal/month
- or -
23" to 27"
6 meals/year
- or -
Larger than 27"
Do Not Eat
Contaminant - **PCBs**

Yellow Perch

All Waters
All Sizes
1 meal/week
Contaminant - **PCBs**

Carp

All Waters
All Sizes
Do Not Eat
Contaminant - **PCBs**

Figure 1-2. Illinois Lake Michigan Fish Advisory
Source: www.idph.state.il.us/envhealth/factsheets/fishadv.htm

Mercury Advisories

Mercury is a metal that occurs naturally in small amounts in the environment. It also enters the environment from burning coal or trash and can then enter the food chain. Mercury gets into lakes and rivers in several ways, in addition to atmospheric deposition, including rain and runoff.

According to the USEPA (Publication EPA-823-F-01-011), once released into the environment, inorganic mercury can be converted to organic mercury (methylmercury) which is the primary form that accumulates in fish and shellfish. Methylmercury biomagnifies up the food chain as it is passed from a lower food chain level to a subsequently higher food chain level through consumption of prey organisms or predators. Fish at the top of the aquatic food chain, such as pike and bass in lakes, and shark and swordfish in oceans, bioaccumulate methylmercury approximately 1 to 10 million times greater than dissolved methylmercury concentrations found in surrounding waters. Methylmercury is stored in the muscle of fish, the part of the fish people eat. Skinning and trimming the fish does not significantly reduce the mercury concentration in the fillet, nor is it removed by cooking processes. Because moisture is lost during cooking, the concentration of mercury after cooking is actually higher than it is in the fresh uncooked fish. In contrast, PCBs adhere to fat, so the removal of skin and fat, as well as broiling the meat, removes up to 90 percent of the contamination.

Great Lakes Fish Monitoring Program

The Great Lakes Fish Monitoring Program (GLFMP) began in 1980 as a cooperative effort by USEPA, U.S. Food and Drug Administration (no longer participating), U.S. Fish and Wildlife Service (now the Biological Resources Division of U.S. Geological Survey), and the eight Great Lakes States, to monitor and better define the fish contaminant problem in the Great Lakes. The program consists of two separate elements to monitor contaminants in whole predator fish and in game fish fillets.

Element 1, Open Lakes Trend Monitoring Program for whole fish, is directed at monitoring contaminant trends in the open water of the Great Lakes, and assisting in evaluating the impacts of contaminants on the fishery. The program provides for collection and analysis of whole-fish composites of lake trout (Salvelinus namaycush) in the size range from 600 mm to 700 mm from Lakes Michigan, Huron, Ontario, and Superior, and of walleye (Stizostedion vitreum) in the size range of 400 mm to 500 mm from Lake Erie. Composites of each species, consisting of five whole individual fish, are analyzed for contaminants to assess temporal trends in organic contaminants in the open waters of the Great Lakes, using fish as biomonitors. These data can also be used to assess the risks of such contaminants on the health of this important fishery and on the wildlife that consume them.

Element 2, Game Fish Fillet Monitoring Program, is directed at monitoring potential human exposure to contaminants through consumption of popular sport species, as well as providing temporal trend data for top predator species, which have shorter exposures than the lake trout collected in Element 1. Coho salmon (Oncorhynchus kisutch) and Chinook salmon (Oncorhynchus tshawytscha) are collected from Lakes Michigan, Huron, Ontario, and Superior, and rainbow trout (Salmo gairdneri) are collected from Lake Erie during the fall spawning run. Composites of each species, consisting of five individual fish fillets, are analyzed for organic contaminants to assess potential human exposure. These data complement those from Element 1. Trends are not meant to be concluded from Element 2, as the voluntary nature of the program does not allow for consistent collection of salmon from year to year. For trend analysis, GLNPO is currently using only the fish tissue contaminant data for coho salmon from Lake Michigan that are larger than 500 mm.

The GLFMP currently collects samples, for both elements of the program, from a set number of sites per lake. Collections alternate on a yearly basis, with even and odd year collections. Element 1 samples consist of 5 whole fish composites for a total of 50 fish collected per site. Element 2 samples consist of 5 skin-on fillets for a total of 15 fish collected per site. All samples are provided to analytical laboratory (currently a university grantee) as approximately 10 grams of frozen homogenate. The GLFMP currently utilizes an established chemical parameter list for analysis, though in recent years emerging contaminants of concern, such as polybrominated diphenyl ethers (PBDEs) and perfluorinated compounds (PFOS, PFOA) have been added.

More information is available at: www.epa.gov/glnpo/glindicators/fish.html.

Mercury is emerging as a growing concern in fish in Lake Michigan, inland lakes in the basin, and in the ocean. To address this concern, the states, U.S. Food and Drug Administration (FDA) and USEPA have issued mercury advisories governing the consumption of fish. In 2004, FDA and USEPA issued a joint advisory on methylmercury in fish and shellfish for reducing the exposure to high levels of mercury in Women Who Might Become Pregnant, Women Who are Pregnant, Nursing Mothers, and Young Children . It advises people in these groups to not eat shark, swordfish, king mackerel, or tilefish. FDA also advises that women of childbearing age and pregnant women may eat an average of 12 ounces of fish purchased in stores and restaurants each week. Therefore, if in a given week such a woman eats 12 ounces of cooked fish from a store or restaurant, she should not eat fish caught by her family or friends that week. It is important to control the total level of methylmercury consumed from all fish. USEPA, FDA, and state officials are working together to ensure the advice is effective and gets to the appropriate audiences.

Collaborative Lake Michigan Strategy to Address Impaired Waters

The purpose of this strategy is reduce and virtually eliminate impairments caused by contaminants such as mercury, PCBs, and certain banned pesticides that have resulted in fish consumption advisories, into the Lake Michigan ecosystem.

The states have primary responsibility for preparing Total Maximum Daily Loads (TMDL) for impaired water bodies and USEPA agrees to provide resources, technical assistance and facilitation to support the states' TMDL development efforts on interstate waters like the Great Lakes. Furthermore, recent changes to USEPA 303(d) list guidance allow the states to address

The Lake Michigan Toolbox
The Mercury Challenge

The National Partnership for Environmental Priorities' (NPEP) Mercury Challenge promotes the voluntary, systematic elimination of mercury-containing equipment from industrial sites. Mercury is a highly toxic chemical designated as one of 31 priority chemicals that USEPA wants to reduce in our nation's products and wastes. Mercury is a documented contaminant of air, land, water, plants, and animals and exposure to mercury can cause serious health problems.

More information on mercury resources is available at the following sites:

- USEPA's mercury program at: www.epa.gov/mercury/
- The Take the Mercury Challenge program at: www.epa.gov/epaoswer/hazwaste/minimize/merc-chal/mc_join.htm
- "Building a Mercury Reduction Plan" http://epa.gov/wastemin/merc-chal/mc_redplan.htm
- Mercury-Free Success Stories http://epa.gov/wastemin/merc-chal/mc_success.htm
- "Mercury: Serious Problem, Practical Solutions" Brochure at: http://epa.gov/wastemin/merc-chal/hg-10-05.pdf

impaired waters that are being remediated by other means in a manner that could delay or possibly eliminate the need for TMDL development.

A strategy to address the impaired waters of Lake Michigan will take time to develop and implement and needs to provide opportunities for the parties to work collaboratively so to effect air quality reductions in mercury that lead to perceptible reductions in state waters and related fish tissues. This raises the question of what a strategy to address the impaired waters of Lake Michigan should be? Any strategy will take time to develop and implement. It should provide opportunities for the parties to work collaboratively and avoid duplication of effort. Such a strategy would be useful to divide the development and possible products from the discussion into stages aligned with the LaMP publications from 2006 through 2010. The stages could include activities and milestones tracked over time to ensure that progress is being made to remediate Lake Michigan. Any strategy would need to be reviewed and mid-course changes considered at each two year interval. If sufficient progress is not made by 2010, work on standard TMDLs for Lake Michigan would need to begin and be completed by 2013 per the current 303(d) schedule and USEPA regulation.

To implement this approach, the following activities should be conducted over the next two years:

- Continue discussion of the Strategy concept
- Clarify common definition of "open waters"
- Finalize the 2005 Intensive Lake Michigan Monitoring Plan and GLNPO Open Lake Organics monitoring with Lake Michigan Mass Balance models
- Develop and share matrix of successful federal, state, and local programs
- If developed, publish the Strategy in LaMP 2008

Illinois Proposes 90 Percent Mercury Emissions Reduction

Illinois Governor Rod Blagojevich announced a proposal that would cut mercury emissions from power plants by 90 percent by June 30, 2009. The state standards would reduce mercury emissions faster than new federal restrictions adopted last spring and aims to achieve the largest overall amount of mercury reduction of any state in the country. The rule was submitted to the Illinois Pollution Control Board in February 2005.

The proposed Illinois rules would require a 90 percent emissions reduction by June 30, 2009, and prohibit power plants from purchasing allowances, or trading emissions credits with other companies. The proposal would require that power plant operators must reduce emissions by an average of 90 percent across their entire fleet of plants by June 30, 2009. Each individual plant must achieve at least a 75 percent reduction by 2009, and 90 percent reduction by December 31, 2012. Illinois' fleet of coal burning power plants is the largest in the nation to be subject to such dramatic emission limits.

The Lake Michigan LaMP 2000, Appendix E, provided an overview of issues and information needs for a full TMDL Strategy for Lake Michigan. LaMP 2002 and 2004 summarized the dialogue and meetings since LaMP 2000 and provided an early draft of a Mercury Phase Out Proposal and also provided data from the Lake Michigan Mass Balance Study and Enhanced Tributary Monitoring Project.

State activities related to mercury reduction are summarized at the end of this chapter . These pages are from the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Status of Mercury TMDLs in the Basin

Based on state submittals of the 2004 303(d) impaired waters lists, there are 217 waters in the Lake Michigan basin listed as impaired for mercury. The 217 impaired waters are located in the Lake Michigan states of Illinois (2), Indiana (81), Michigan (88), and Wisconsin (46). With every 303(d) list submittal, states are required to identify waters targeted for TMDLs in the next two years. In 2004, the Lake Michigan states did not include any mercury-impaired waters on their two-year schedule for TMDL development. However, Michigan did submit a long-term TMDL development schedule that included development of mercury TMDLs beginning in 2011.

There are efforts underway by states outside of the Lake Michigan Basin to address waters impaired by atmospheric mercury. Minnesota is in the process of developing a draft statewide TMDL for mercury-impaired waters. The TMDL would address 214 impaired waters in the Lake Superior Basin and exclude Lake Superior waters.

USEPA is also currently reviewing proposals from Massachusetts and Maine to re-classify waters impaired by atmospheric mercury from category 5 (requiring a TMDL) to Category 4b. TMDLs are not required for waters placed in category 4b, as other required controls (e.g., federal and state efforts to reduce mercury emissions) are expected to achieve water quality standards over time. USEPA has agreed to provide technical assistance to support states efforts to develop mercury TMDLs.

The Lake Michigan Toolbox
Mercury Programs Database

The Mercury Reduction Programs Database was developed and maintained by Region 1 and 2's Northeast Waste Management Officials' Association (NEWMOA). with support and assistance from the Environmental Council of the States (ECOS) and the Pollution Prevention Resource Exchange (P2Rx).

The database can be searched by program, by state, and by agency to find out what mercury reduction programs are taking place nationally. Programs can also be added by organizations.

More information is available at:
www.p2rx.org/Networking/MercuryDB.cfm

Sources of Current Mercury Emissions in the U.S. (2002)

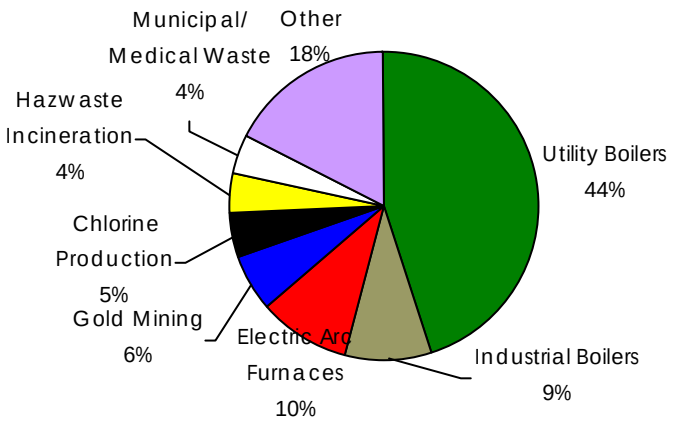


Figure 1-3: USEPA, 2002 National Emissions Inventory

USEPA Issues New Mercury Rules

On March 15, 2005, USEPA issued the Clean Air Mercury Rule to permanently cap and reduce mercury emissions from coal-fired power plants for the first time ever. Additionally, in an action closely related to the Clean Air Mercury Rule, the USEPA has issued a proposal to reconsider certain aspects of its rule to revise the December 2000 finding. USEPA is responding to petitions for reconsideration submitted by 14 states, five environmental groups and four tribes.

More information is available at:
www.epa.gov/air/mercuryrule/.

Sources of Mercury

Air deposition is the dominant mercury pathway for most water bodies. Sources of mercury in the atmosphere are divided roughly at 1/3 natural, 1/3 from past human activity, and 1/3 from current human activity around the world. The current human activity in the U.S. Mercury emissions are shown in Figure 1-3 (See preceding page).

The Great Lakes Regional Collaboration (GLRC) is one potential vehicle for developing a basin-wide mercury product stewardship strategy and basin-wide mercury phase-down program, including a mercury waste management component. The states and the tribes are putting together a workgroup to develop a common strategy.

NPDES Pollutant Minimization Program

In addition the USEPA Region 5 Water Division and states have reached agreement on a draft guidance document for the NPDES Permit Pollutant Minimization Program (PMP) for Mercury. The goal is to aid in meeting the Great Lakes Initiative water quality standards the states adopted for mercury in permits. The PMP guidance was provided in 2004 More information is available at the Pretreatment Website at: www.epa.gov/r5water/npdestek/npdprta.htm.

Next Steps

- Develop the Impaired Waters Strategy
- Clarify common definition of "open waters"
- Cleanup of superfund sites and other PCB contaminated harbors
- Support efforts to recycle mercury-containing electronic devices

Great Lakes Regional Collaboration Goals and Recommendations Relevant to the Lake Michigan LaMP Subgoal 1

Persistent Bioaccumulative Toxics Group Goals and Recommendations

Goals

Goal 1: Virtually eliminate the discharge of any or all persistent toxic substances (PTS) to the Great Lakes basin ecosystem.

Goal 2: Significantly reduce exposure to persistent toxic chemicals from historically contaminated sources through source reduction and other exposure reduction methods.

Goal 3: Reduce environmental levels of toxic chemicals to the point that all restrictions on the consumption of Great Lakes fish can be lifted.

Goal 4: Protect the health and integrity of wildlife populations and habitat from adverse chemical and biological effects associated with the release of PTS.
Interim Milestones, Goals 1-4:

- By 2008, collect 1million lbs of waste pesticides per year.
- By 2010, 50 percent reduction in Basin-wide household garbage burning.
- By 2010, commence significant reductions in mercury emissions from coal-fired power plants.
- By 2015, full phase-out of as many intentionally added mercury bearing products, as possible.
- By 2025, full phase-out of all PCB equipment in the basin.
- By 2025, significantly reduce PTS inputs from international sources.

Goal 5: Prevent the discharge of toxic substances in toxic amounts.

Interim Milestones, Goal 5:

- By 2008, include pollution prevention and energy efficiency (P2/E2) provisions in federal and state rule making.
- By 2010, implement 200 P2/E2 projects for businesses in the Great Lakes States.

Goal 6: Protect the general public from toxic substances through effective outreach and education, including protective fish consumption advice throughout the Great Lakes Basin Ecosystem.

Interim Milestones, Goal 6:

- By 2007, commence basin-wide PTS public information campaign.
- By 2009, adopt consistent Great Lakes basin fish consumption advisories.

Goal 7: Identify and fill the gaps in our scientific understanding that limit our ability to effectively manage the risks of toxic substances found in the Great Lakes.

Interim Milestones, Goal 7:

- By 2008, initiate a central Great Lakes PTS database.
- By 2010, a basin-wide surveillance program of chemicals of emerging concern at wastewater treatment plants will be established. At least 50 percent of the large in-basin Waste Water Treatment Plants will participate in the program.
- By 2010, implement a Great Lakes human PTS biomonitoring program.
- By 2010, complete an intercomparison study of mercury and PCB models.

Recommendations

1. Reduce and virtually eliminate the principal sources of mercury, PCBs, dioxins and furans, pesticides and other toxic substances that threaten the health of the Great Lakes basin ecosystem, through coordinated, intergovernmental strategies.
2. Prevent new toxic chemicals from entering the Great Lakes basin: Target production, use and sound disposal of toxic chemicals across the Great Lakes basin through strategic deployment of pollution prevention and waste minimization programs.
3. Institute a comprehensive Great Lakes research, surveillance and forecasting capability to help identify, manage, and regulate chemical threats to the Great Lakes basin ecosystem. A Great Lakes basin-wide coordinated program that incorporates and augments current efforts should

be created to better characterize links between PTS sources and exposure. The multiparty program should preferably be housed within an existing program or organization and call upon the combined resources of federal agencies, states, academia, the private sector, and our Canadian neighbors.

4. Protect human health through consistent and easily accessible basin-wide messages on fish consumption and toxic reduction methods and choices.
5. Support efforts to reduce continental and global sources of PTS to the Great Lakes basin.

The pages that follow provide an overview of state activities related to mercury reduction. They were originally published in the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Illinois' Mercury Actions

Illinois Environmental Protection Agency ◆ www.epa.state.il.us/mercury/
Contact: Becky Lockart ◆ phone: 217-524-9642 ◆ fax: 217-557-2125 ◆ Becky.Lockart@epa.state.il.us

Mercury Strategies & Outcome Measures

Outcome measures used to quantify progress include:

- ✓ Total amount of mercury collected
- ✓ Number of schools that have conducted mercury cleanup
- ✓ Amount of mercury releases

Laws & Policies to Reduce Mercury Use & Releases

Industrial Releases

- ✓ State regulations on mercury releases from hazardous waste.
- ✓ Federal MACT rules and wastewater treatment permit limits are implemented where appropriate.

Mercury Products

- ✓ Phased out the sale of mercury fever thermometers and mercury novelty products.[1]
- ✓ Effective in 2007, sale of selected mercury electrical switches and relays (with exemptions) will be prohibited.[2]
- ✓ Phase out the use of mercury and mercury-containing devices in K–12 schools.
- ✓ Mercury collection programs for elemental mercury, mercury waste, mercury-containing products, and recycling of collected mercury are voluntary. Mercury collection is done by contractors who are required to ship mercury to permitted retorting facilities. Contractors must provide disposition certificates from the reporting facilities prior to the IEPA's approval for payment.
- ✓ IEPA funds 30–45 household hazardous waste collections per year, as well as cleans 200–250 K–12 schools per year through the school waste program.
- ✓ Cooperative initiative with the Illinois Dental Association to collect mercury and amalgams from dentists.
- ✓ Mercury switches and regulators must be removed from appliances before shredding/scrapping.
- ✓ State law restricts the burning of mercury-containing fluorescent bulbs.
- ✓ Universal waste rules adopted to encourage recycling of mercury-containing products.

Fish Consumption Advisory

Statewide Fish Consumption Advisory
Due to Mercury Contamination[3]

- 6,264 lake acres under advisory
- 1,034 river miles under advisory
- 8 lakes and ponds under advisory

Top Intrastate Mercury Sources

State Estimate

1 → coal-fired power plants
2 → industrial boilers
3 → cement kilns

Illinois' Mercury Actions, continued

Mercury Monitoring

- ✓ On-going fish tissue testing and sampling.
- ✓ Also monitor: ambient air, wastewater discharge, fish tissue, and mercury collection (pounds of mercury collected from IEPA household waste collection program is recorded).
- ✓ The Bureau of Water performed a pilot test to compare water sampling techniques to determine if EPA Method 1699, which is resource-intensive, was necessary to obtain reliable results when testing for very low concentrations of mercury.

Public Outreach Efforts

Topics: disposal, cleanup, & reduction progress

Outreach Tools: factsheets, brochures, website, public service announcements, & media events

Vehicle Switches

- ✓ IEPA prepared a report identifying options for mercury switch removal and management from discarded vehicles.
- ✓ Legislation to require automakers to establish a removal and management program for mercury switches from discarded vehicles has been introduced.

Citations

1. Public Act 93-165. Online at: http://www.ilga.gov/legislation/publicacts/fulltext.asp?name=093-0165&GA=093
2. Public Act 93-964. Online at: http://www.ilga.gov/legislation/publicacts/fulltext.asp?093-0964&GA=093
3. Fish Consumption Advisory. Online at: http://www.idph.state.il.us/envhealth/fishadv/fishadvisory05.htm

Originally published in the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Indiana's Mercury Actions

Indiana Department of Environmental Management
Contact: Paula Smith ◆ phone: 317-233-5624 ◆ fax: 317-233-5627 ◆ psmith@idem.IN.gov

Mercury Strategies & Outcome Measures

In Indiana the Air Workgroup, Triennial Streamlined Mercury Variance Workgroup, and the Internal Mercury Workgroup are comprised of a variety of participants that specifically focus on mercury issues.

Outcome measures used to quantify progress include:

- ✓ Air emission reductions
- ✓ Ambient air quality improvements
- ✓ Wastewater discharge reductions
- ✓ Total amount of mercury collected
- ✓ Number of mercury-containing devices collected
- ✓ Reduction in the number of fishing advisories/impaired waters
- ✓ Mercury deposition reductions
- ✓ Number of schools that have conducted mercury cleanup
- ✓ Reduction in the amount of mercury in fish tissue
- ✓ Other—dental mercury collections

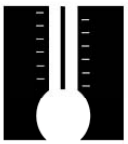
Top Intrastate Mercury Sources

1 → coal-fired power plants
2 → cement kilns
3 → electric arc furnaces

Laws & Policies to Reduce Mercury Use & Releases

Industrial Releases

- ✓ State regulations on mercury releases from sewage sludge incinerators, hazardous waste, municipal solid waste incinerators, medical waste incinerators, cement kilns, and broken mercury-containing products and spills.
- ✓ Adoption of federal MACT for commercial and institutional solid waste incinerators.



Mercury Products

- ✓ Phased out the sale of mercury containing thermometers and novelties. Mercury fever thermometers must be sold behind the counter.
- ✓ Mercury collection programs for elemental mercury, mercury waste, and mercury-containing products. IDEM manages the Mercury Awareness Program that collects and recycles household mercury for all Indiana residents.
- ✓ Collections are made by a licensed hazardous waste contractor and are managed through an IDEM grant program. Household/small business collection/recycling program is funded through recycling and household hazardous waste grant programs and local entities that pick up the remainder of the cost. Indiana has a regulatory mandate for solid management districts to collect recycling.
- ✓ IDEM manages the Indiana mercury pledge for schools.
- ✓ Indiana participates in a thermostat recycling program through Thermostat Recycling Corporation.
- ✓ State has a U.S. Department of Defense mercury stockpile.

Originally published in the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Indiana's Mercury Actions, continued

Fish Consumption Advisory

Statewide Fish Consumption Advisory Due to Mercury Contamination

- 4,007 river miles under advisory in 2004
- 59 coastal wetland miles under advisory in 2004
- 55 lakes and ponds under advisory in 2004
- 68,050 lake acres under advisory (not including Great Lakes) in 2004

Indiana is taking a more comprehensive look at their fish consumption advisory process and will soon be revising their analysis.

Documented Mercury Spills & Releases

Year	# of Spills	Cost
2000	96	N/A
2001	187	N/A
2002	171	N/A
2003	141	N/A

Mercury Monitoring

- ✓ On-going fish tissue testing and sampling.
- ✓ Also monitor: ambient air, mercury deposition, mercury discharge.
- ✓ NESHAP stack testing for medical, hazardous, and municipal solid waste combustors.
- ✓ Indiana participates in the National Mercury Deposition Network.

TMDL Status

- No TMDL's completed, but Indiana has participated in regional and national discussions on mercury TMDL approaches.

Vehicle Switches

- ✓ Indiana is planning to implement voluntary removal of mercury switches from end-of-life vehicles.

Biggest Challenge: Funding for a reward/recovery program.

Public Outreach Efforts

Topics: sources, monitoring, disposal, cleanup, health effects, & reduction progress

Outreach Tools: factsheets, reports, posters, brochures, workshops, emails, press releases, business training, media events, & phone hotlines

Languages: Mercury brochure provided in Spanish.

Targeted Constituencies: subsistence anglers, women of child-bearing age, pregnant women, sport-fishermen, schools, homeowners, & heating ventilation & air conditioning contractors & wholesalers

Unique Outreach: Mercury awareness outreach materials developed to encourage wastewater treatment plants to begin mercury pollution prevention education locally.

Compendium of States' Mercury Activities

Originally published in the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Michigan's Mercury Actions

Michigan Department of Environmental Quality ◆ www.michigan.gov/deqmercuryp2
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Mercury Strategies & Outcome Measures

Michigan has an overall mercury action plan. Major elements of the plan include: medical/dental mercury waste management; limits on mercury discharges into water; reduction of mercury use in consumer products; technical assistance for industries; mercury recycling; and public outreach and education.

A Michigan Mercury Utility Workgroup was convened in August 2003, that includes representatives of industry, non-governmental organizations, government, and academia. The workgroup was tasked to develop a mercury reduction strategy for the state's coal-fired power plants. A full report and recommendations from the workgroup were released in June of 2005.

Outcome measures used to quantify progress include:

- ✓ Air emission reductions
- ✓ Mercury deposition reductions
- ✓ Number of organizations adopting mercury-free purchasing specifications
- ✓ Number of schools that conducted mercury cleanup
- ✓ Number of mercury-containing devices collected
- ✓ Total amount of mercury collected
- ✓ Wastewater discharge reductions
- ✓ Reduction in fish tissue mercury levels
- ✓ Wildlife monitoring

Top Intrastate Mercury Sources

State Estimate

1 → coal-fired power plants

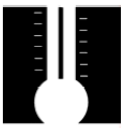
2 → volatilization during solid waste collection and processing

3 → steel manufacturing

Laws & Policies to Reduce Mercury Use & Releases

Industrial Releases

- ✓ State regulations on mercury releases from wastewater treatment and industrial facilities, municipal waste incinerators, and medical waste incinerators.
- ✓ Air permits for certain sources such as shredders and sewage sludge incinerators include mercury specific limits or Best Management Practices (BMP) Requirements.[1]



Mercury Products

- ✓ Mercury-free purchasing policy for state procurement.
- ✓ Phased out the sale of mercury-containing thermometers[2], the use of mercury-containing devices in K–12 schools[3], and the sale of mercury-containing batteries that exceed allowable mercury amounts[4].
- ✓ Mercury collection programs for elemental mercury, mercury waste, and mercury-containing products. Mercury is dropped off at Clean Sweep Sites or Household Hazardous Waste program facilities. Collected mercury and mercury devices are lab packed and transported for recycling by licensed vendors. Recycling of the mercury collected is voluntary. MDEQ encourages Clean Sweep Sites to retain mercury manifests and/or invoices for a minimum of 3 years.

Originally published in the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Michigan's Mercury Actions, continued

Fish Consumption Advisory

Statewide Fish Consumption Advisory Due to Mercury Contamination

- 205,583 lake acres under advisory (does not include Great Lakes)
- 478 river miles under advisory

Mercury Monitoring

- ✓ On-going fish tissue testing and sampling. Tested 304 waterbodies' fish tissue mercury concentrations so far.
- ✓ Also monitor: stack emissions; ambient air & water; wastewater discharge; product and elemental collections; waterbody sediments; and wildlife for mercury.
- ✓ MDEQ-AQD working cooperatively with University of Michigan's Air Quality Laboratory on a mercury monitoring network in Michigan. Six sites in MI collect mercury precipitation (event-based) samples and two of those sites collect mercury-speciated data for estimating both dry and wet deposition.
- ✓ MDEQ-AQD also works cooperatively with the Minnesota Pollution Control Agency and the Wisconsin DNR on assessing fugitive mercury releases with the application of a shared mobile mercury monitoring trailer that houses mercury monitoring and meteorological equipment.

Documented Mercury Spills & Releases[5]

Year	# of Spills
2000	767
2001	1,350
2002	1,261
2003	774

Public Outreach Efforts

Topics: sources, monitoring, disposal, cleanup, health effects, research, & reduction progress

Outreach Tools: factsheets, videos, reports, posters, brochures, workshops, emails, press releases, business training, citizen training, public service announcements, media events, & phone hotlines

Languages: mercury ritual use brochure & alerts in Spanish

Targeted Constituencies: women of child-bearing age, pregnant women, & sport-fishermen

Unique Outreach: MDCH and MDEQ have conducted training for environmental health professionals and first responders, to build capacity in local areas to respond to spills and promote preventative measures.

Mercury TMDL Status

- 1 TMDL completed — developed for Hammell Creek in Houghton County, MI. The source of mercury is an abandoned mine discharge.
- 2 corrective action plans in lieu of TMDLs— Newburgh Lake in Wayne County, and unnamed tributary of Wolf Creek in Montcalm County

Vehicle Switches

- ✓ Voluntary removal of mercury switches (hood lights, trunk lights, & ABS sensor) from end-of-life non-commercial vehicles.
- ✓ Vehicle manufacturers provide training materials, buckets, pick-up and transport.
- ✓ MDEQ recommends that mercury switches be managed as Universal Waste.[6]
- ✓ Biggest Challenge: apportioning out shared responsibilities among industry and government.

Citations

1. Utility Mercury Report at http://www.deq.state.mi.us/documents/deq-aqd-air-aqe-mercury-report.pdf
2. 1994 Mich. Pub. Act 451. Available at: www.legislature.mi.gov/mileg.asp?page=getObject&objName=mcl-324-17202
3. 1976 Mich. Pub. Act 451. Available at: http://www.legislature.mi.gov/mileg.asp?page=getObject&objName=mcl-380-1274b
4. 1994 Mich. Pub. Act 451. 324.17105a and 324.17105b www.michiganlegislature.org/mileg.asp?page=Home
5. Data from the Michigan Poison Control Centers
6. Universal waste requirements, Available at: www.deq.state.mi.us/documents/deq-wmd-Universl.pdf

Compendium of States' Mercury Activities

Originally published in the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Wisconsin's Mercury Actions

Wisconsin Department of Natural Resources ◆ http://dnr.wi.gov/org/caer/cea/mercury/
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Mercury Strategies & Outcome Measures

Wisconsin has an overall mercury action plan. Major elements of the plan include: small business, household, medical, and dental mercury waste management; mercury emission limits; limitation of mercury discharges into water; reduction of mercury use in consumer products; technical assistance for industries; mercury recycling; and public outreach and education programs to reduce exposure. The state has statutes, regulations and policies relating to the mercury action plan. The WDNR has a Mercury Team comprised of key agencies including Health and Family Services, Agriculture, and Trade and Consumer Protection.

Laws & Policies to Reduce Mercury Use & Releases

Industrial Releases	✓ State regulations on mercury releases from coal-fired power plants and wastewater treatment facilities.
Mercury Products	✓ Community Mercury Reduction Programs involving 20 communities focusing on medical, dental, school, HVAC thermostat, auto switch, and dairy farming products. ✓ Voluntary mercury collection programs for elemental mercury, mercury waste, and mercury-containing products. Mandatory recycling of collected mercury. All mercury-containing products are classified as universal wastes or are conditionally exempt from hazardous waste rules with the condition that waste be recycled. All public and private mercury collection sites are permitted and inspected by the WDNR. ✓ Local clean sweeps and specific mercury reduction pilot programs receive state or federal grants that subsidize mercury collection and recycling.
Vehicle Switches	✓ Voluntary removal of mercury switches (hood & trunk lights) from end-of-life passenger cars and trucks. ✓ Progress is quantified by pounds of mercury waste collected and number of auto dismantlers and scrap yards participating. ✓ Cooperative effort between WDNR and Auto and Scrap Recyclers trade association: by participating in mercury auto switch removal and recycling, the auto recyclers satisfy the mercury recovery component of required stormwater management plan. Auto dismantlers are voluntarily included as part of Storm Water Permit requirements. ✓ Collection buckets, spill kits, and instructions provided to participating yards by WDNR. Designated consolidation sites were provided proper collection bins and spill kits. Sites must be approved by WDNR. Mercury recycling vendors must be licensed. Records are maintained at each consolidation site and by the recycling vendor who must report to WDNR. ✓ A Great Lakes National Program Office grant funded a mercury collection project from 2001–June 2005 that included educational outreach and free recycling. <u>Biggest Challenge:</u> Improving participation of scrap yards and funding.

Originally published in the Environmental Council of the States' Quicksilver Caucus report, "Compendium of States' Mercury Activities." The full report can be found at: www.ecos.org/section/2005_mercury_compendium.

Wisconsin's Mercury Actions, continued

Fish Consumption Advisory

Statewide Fish Consumption Advisory Due to Mercury Contamination

- 57,000 river miles under advisory
- 15,000 lakes and ponds under advisory

Mercury Monitoring

- ✓ On-going fish tissue testing and sampling. Tested fish from more than 810 water bodies' so far.
- ✓ Also monitor: emissions, ambient air, wastewater discharge, mercury deposition, water body sediment, & wildlife.
- ✓ Wisconsin participates in the National Mercury Deposition Network.
- ✓ Development of an atmospheric modeling system for the Great Lakes Region.

Public Outreach Efforts

Topics: sources, monitoring, disposal, cleanup, health effects, research, & reduction progress

Outreach Tools: factsheets, reports, posters, brochures, press releases, & phone hotlines

Languages: Fish consumption advisory and public health advice in Spanish and Hmong

Targeted Constituencies: women of child-bearing age, pregnant women, subsistence fishers, sport-fishermen, & the general population

Top Intrastate Mercury Sources

State Estimate

1 → coal-fired power plants
2 → dental amalgam
3 → broken mercury-containing products & spills

Citations

1. Available at: http://dnr.wi.gov/org/water/fhp/fish/pages/consumption/index.shtml