

Lake Michigan Monitoring Coordination Council

Collaborative Monitoring in the Great Lakes: Revisiting the Lake Michigan Mass Balance Project

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National Monitoring Conference

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Great Lakes Commission

- Binational agency representing Great Lakes states and provinces
- Formed in mid 1950s via U.S. state and federal law: provincial associate membership in 1999
- Promotes the informed use, management and protection of the water and related natural resources of the Great Lakes Basin and St. Lawrence River

Great Lakes Hydrologic and Political Boundaries



Focus of talk

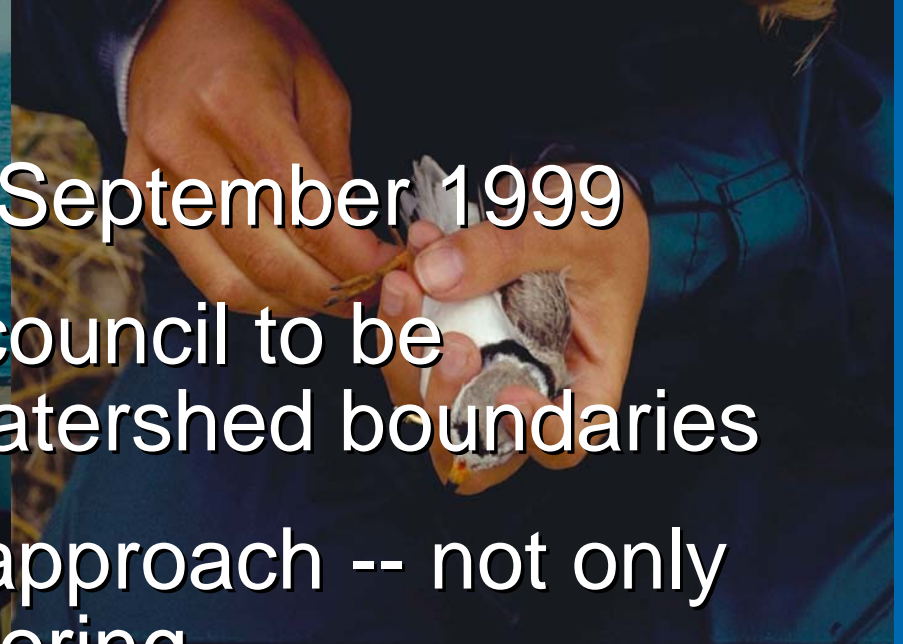
- Lake Michigan Monitoring Coordination Council
- Lake Michigan Tributary Monitoring Project
 - Progress to Date
 - Lessons

Two Issues

1. Information collected according to political boundaries rather than resource boundaries
2. Information collection agencies focused on narrow fields of study

Lake Michigan Monitoring Coordination Council (LMMCC) Background

- Inaugural meeting September 1999
- First Great Lakes council to be structured along watershed boundaries
- Broad ecosystem approach -- not only water quality monitoring



Council Background

- Serves as a regional forum to coordinate and support consistent, credible monitoring methods and strategies
- Purpose: to define a regionally-coordinated agenda for Lake Michigan basin monitoring, with improved collaboration and data comparability
- Great Lakes Commission provides technical & organizational support

Lake Michigan Monitoring Coordination Council

➤ Council Objectives:

- Document activities, identify gaps and contribute to a monitoring plan for the basin
- Maintain collaborative partnerships
- Document data quality and comparability
- Link basinwide information systems
- Improve awareness of monitoring and Council products

Membership

- State Tribal nations/associations (2)
- Business, industry and consultants (2)
- Agricultural groups (1)
- Local volunteer or environmental groups (2)
- Sea Grant Programs or university-based institutes (4)
- Lake Michigan LaMP Forum (1)
- Local government/planning agencies (4)
- Great Lakes Fishery Commission (1)
- Chair of LaMP Technical Coordinating Committee and Great Lakes Commission (ex-officio members)
- agencies (8)
- Federal agencies (7)

Workgroups

- Air
- Aquatic Nuisance Species
- Fisheries
- Groundwater
- Land Use
- Open Lake
- Recreational Waters
- Research
- **Tributaries**
- Wetlands
- Wildlife
- Collaboration and Outreach
 - Technical coordination
 - Communication/outreach
 - Workshop/ meeting planning

Coordinated Tributary Monitoring Goals

- Evaluate/compare contaminant loadings from key tributaries
- Compare loading rates with 1994-95 loading rates
- Incorporate results into Lake Michigan Mass Balance (LMMB) model
- Program support (Lake Michigan LaMP, RAPs, SOLEC)

Questions to ask?

- What information is important to provide a 10-year snapshot of the LMMB?
- Who collects LMMB parameter data?
- How can we link ongoing monitoring with minimal new resources to achieve project objectives?
- How best can we combine resources?

Development of Lake MI Tributary Monitoring Project

- Looked at parameters of the Lake Michigan Mass Balance Study
 - What monitoring parameters and site locations should be considered for this project?
- Decided to propose a “10-year anniversary snapshot” for key Lake Michigan tributaries
- Developed several monitoring options based upon funding availability and statistical viability

Workshop – June 2004

- Determined potential monitoring locations and parameters in Lake Michigan for 2005-06
 - Discussed details of each option
 - Finalized parameters to monitor
 - Compared specific monitoring protocols
 - Began development of final plan for 2005-06 monitoring event – including site selection

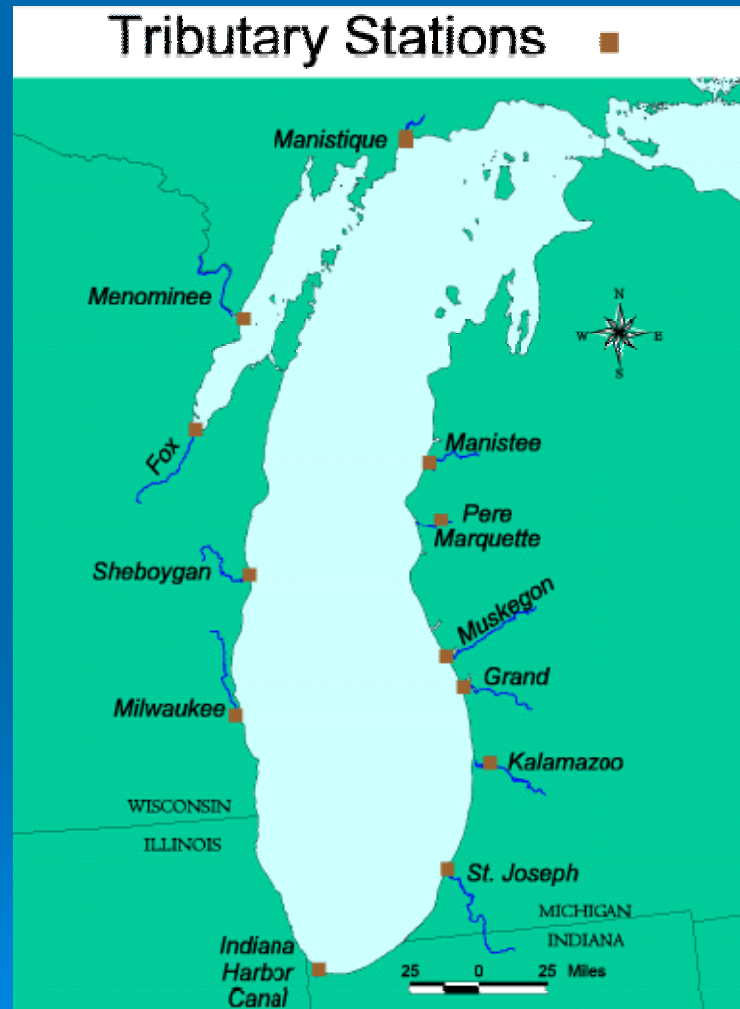
2005-2006 Lake MI Tributary Monitoring Project Objectives

- Characterize present-day water column PCB, nutrient, and mercury concentrations at five (5) of the original 11 Lake Michigan Mass Balance sampling sites.
- Estimate mass loading for each of the five sampled Lake Michigan tributaries.
- Estimate the uncertainty associated with each of the loading estimates.
- Compare concentration and loading estimates with the 1994-1995 Lake Michigan Mass Balance project.

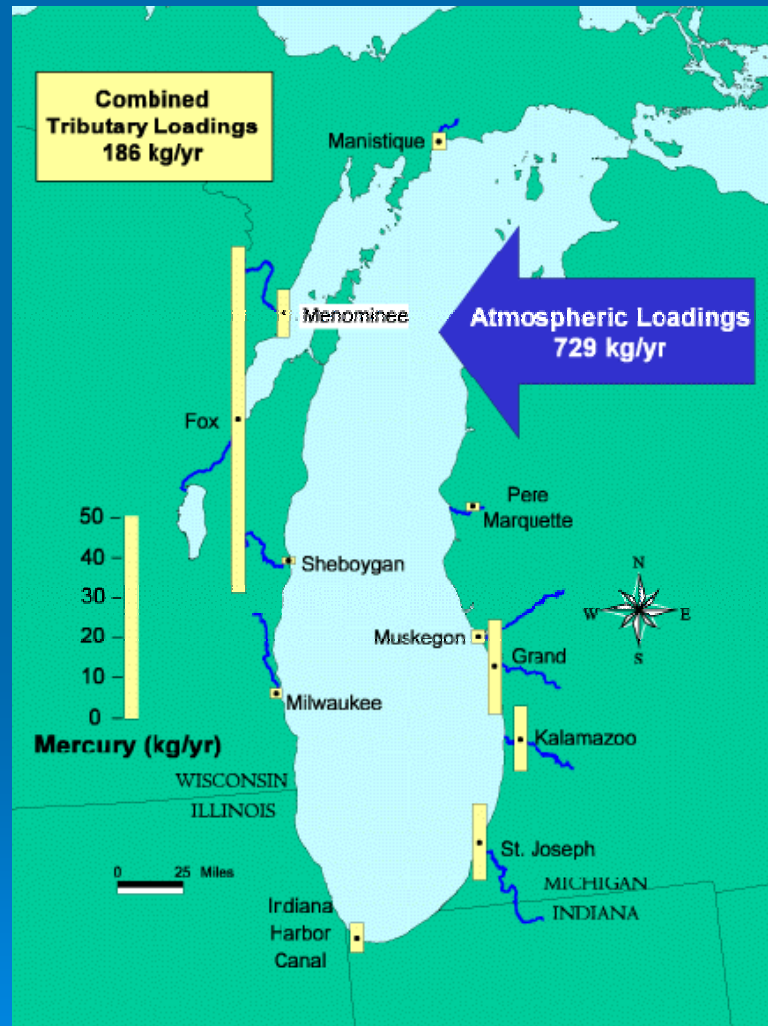
FUTURE
WORK

1994 – 1995 Lake MI Mass Balance

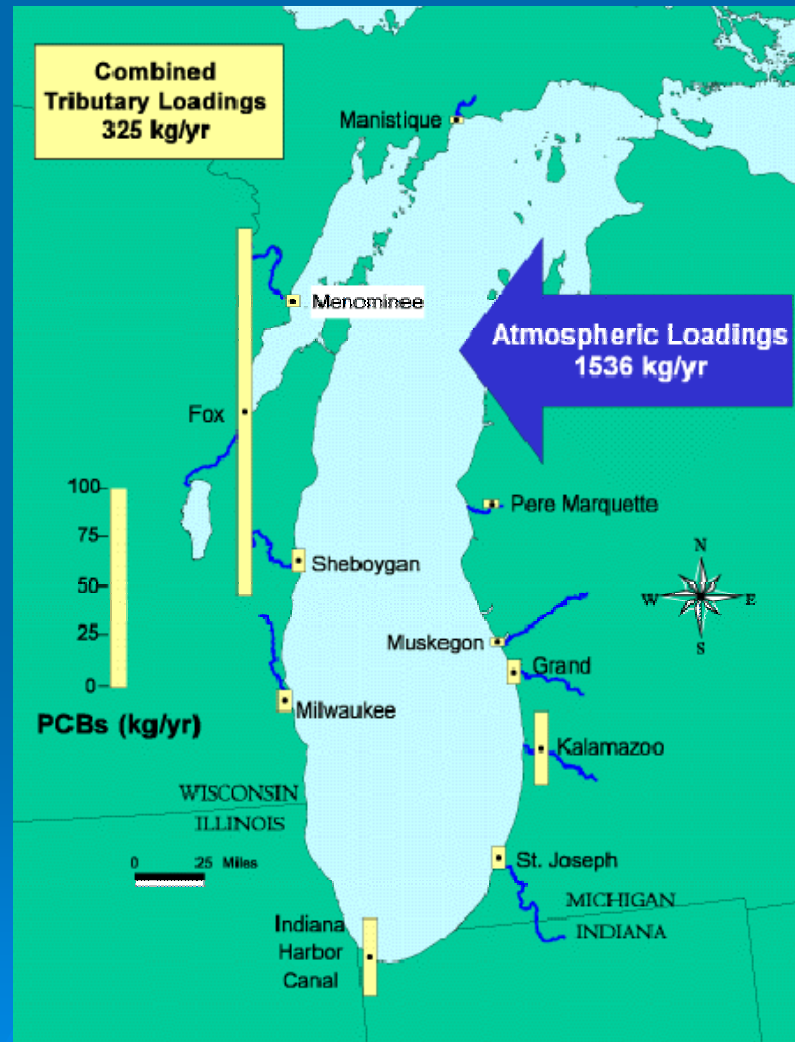
Tributary Monitoring Stations (12)



1994 – 1995 LMMB Mercury Loads

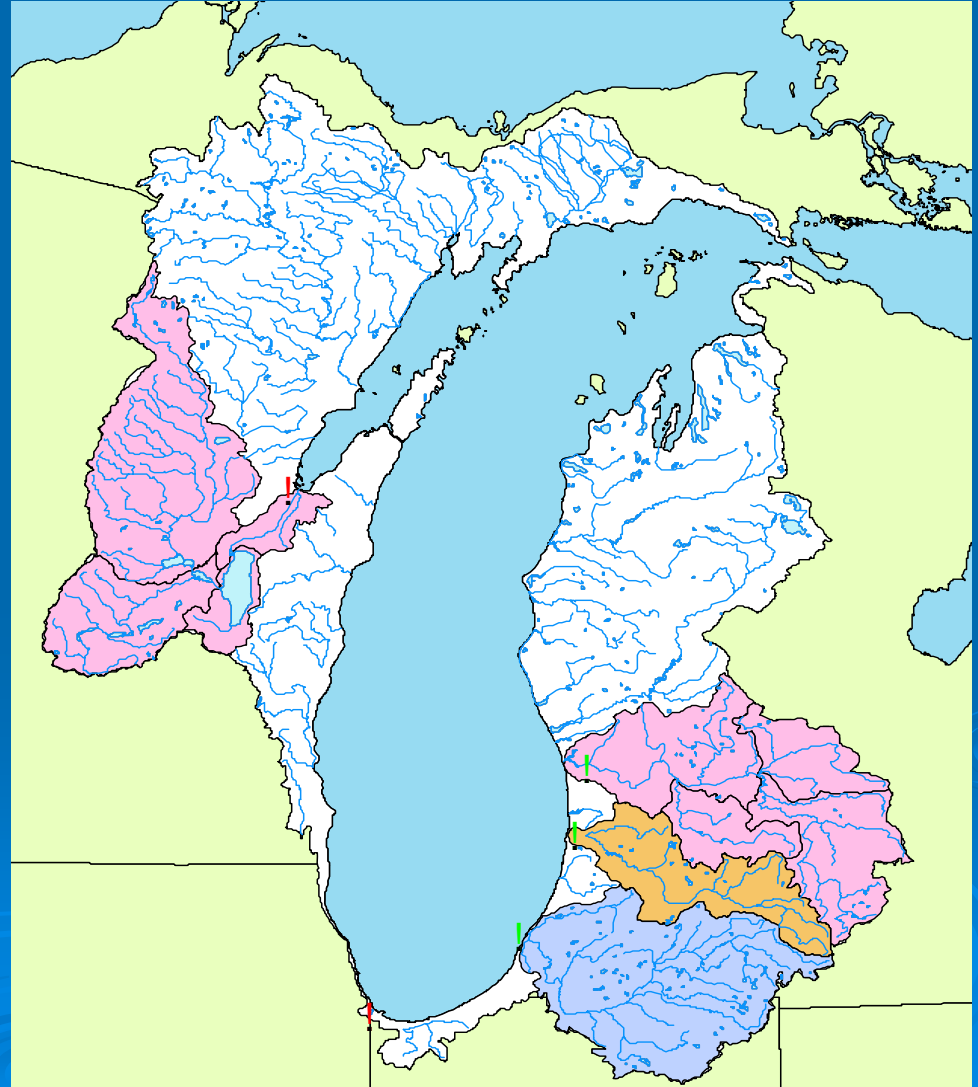


1994 – 1995 LMMB PCB Loads



2005-2006 Lake MI Tributary Monitoring Project Sites

- Lower Fox (WI)
- Indiana Harbor Canal (IN)
- St. Joseph (MI)
- Kalamazoo (MI)
- Grand (MI)



Analytes

Parameters:

- Total PCB congeners (dissolved and particulate for Indiana and Wisconsin Sites)
 - Total Mercury (particulate and dissolved, total and methylmercury, Fox River only)
 - Nutrients and solids
 - ~~➤ Atrazine~~
 - ~~➤ *trans*-Nonachlor~~
- ELIMINATED TO MINIMIZE
TOTAL PROJECT COST**

Coordinated Tributary Monitoring Project Funding

- Project Planning and Management
 - In kind funding from USEPA, GLC, MI DEQ, USGS WI WSC
- Michigan DEQ Monitoring
 - November, 1998: Clean Michigan Initiative
 - For 2005, priorities realigned to allow 12 PCB and mercury samples from the 3 tributaries
- USGS Monitoring, Data Analyses and Reporting
 - EPA GLNPO funds via Great Lakes Commission
 - USGS Cooperative Water Program funds

Coordinated Tributary Monitoring Timeline

- Project design (April 2004 – March 2005)
- Sample collection (April 2005-July 2006)
- Sample analysis (July 2005-October 2006)
- Data analysis (August 2006-April 2007)
- Draft report (June 2007)

Sample Volume and Timing of Collection

PCB Sample Volumes:

- Indiana Ship Canal: 80 L samples
- Fox River: 80 L samples (summer)/ 160 L samples (winter)
- St. Joseph, Kalamazoo, and Grand: 160 L samples

Sample Timing:

- Indiana Ship Canal: 100% scheduled
- Fox, Grand, Kalamazoo and St. Joseph: 33% baseflow / 66% high flow

Progress to Date (April 2006)

- Fox River: 7 samples / 1 duplicate / 1 blank
- Indiana Ship Canal: 6 samples/ 1 duplicate / 1 blank
 - Sampling at the Indiana and Wisconsin sites will be completed by the end of July, 2006
- St. Joseph, Kalamazoo, and Grand: 12 samples (complete)

Lessons Learned

- Various management objectives require collection of information
- Coordinate individual monitoring programs to meet additional objectives
- Focus resources/personnel available to coordinate data collection, analysis and reporting
- Partners must be willing to compromise (i.e. provide necessary in-kind support)
- Central funding source can drive the process
 - A bare-bones budget can still provide a status report on important parameters to measure water quality

For More Information

- LMMCC website
 - <http://wi.water.usgs.gov/lmmcc/>
- John Hummer (GLC)
 - 734-971-9135 or jhummer@glc.org
- Charlie Peters (USGS)
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