



# LAKE MICHIGAN LAKEWIDE MANAGEMENT PLAN

## Annual Report 2010

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### What is the LaMP?

Under the Great Lakes Water Quality Agreement (GLWQA), as amended in 1987, the United States and Canada agreed "to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem." To achieve this objective, the parties agreed to develop and implement Lakewide Management Plans (LaMPs) for open waters and Remedial Action Plans (RAPs) for contaminated Areas of Concern (AOCs). The GLWQA also called for LaMPs to identify land-based activities contributing to degraded water quality and development of watershed plans to control non-point source pollution

The Lake Michigan LaMP is a collaborative effort among federal, state and tribal governments and a public involvement partnership with the Lake Michigan Forum.

### Overview

Lake Michigan is the second largest Great Lake by volume and the only one located totally within the United States. Of the basin's 45,000 square miles, the northern portion is colder, covered with second growth forest and less developed except for the Fox River Valley. 307 miles to the south, the more temperate southern portion is very developed from Milwaukee through Chicago to Northwest Indiana. Lake Michigan discharges into Lake Huron through the Straights of Mackinac at a rate that allows for a complete change of water about every 100 years.

Lake Michigan contains the world's largest collection of fresh water sand dunes along with many wetlands, prairies, and savannas all providing essential habitat to a great diversity of life. The aquatic food web supports fish for food, sport and culture. The southern-soils are typically fertile and amenable to agriculture and the coast is home to 25 harbors and hundreds of marinas. The Lake Michigan coastlines also serve as a key North American flyway.

The LaMP vision is of "a sustainable Lake Michigan ecosystem that ensures environmental integrity and that supports and is supported by economically viable, healthy human communities." The primary goal "is to restore and protect the integrity of the Lake Michigan ecosystem through collaborative, place-based partnerships." The LaMP focuses its efforts in meeting the vision and goal through monitoring the changing environmental conditions and adapting management strategies by addressing the following:

1. Can we eat any fish?
2. Can we drink the water?



Sailing along Milwaukee shoreline, Milwaukee, Wisconsin  
Lake Michigan Federation



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3. Can we swim in the water?
4. Are habitats healthy, naturally diverse, and sufficient to sustain viable biological communities?
5. Does the public have access to abundant open space, shorelines, and natural areas, and does the public have enhanced opportunities for interaction with the Lake Michigan ecosystem?
6. Are land use, recreation, and economic activities sustainable and supportive of a healthy ecosystem?
7. Are sediment, air, land, and water sources or pathways of contamination that affect the integrity of the ecosystem?
8. Are aquatic and terrestrial nuisance species prevented and controlled?
9. Are ecosystem stewardship activities common and undertaken by public and private organizations in communities around the basin?
10. Is collaborative ecosystem management the basis for decision-making in the Lake Michigan basin?
11. Do we have enough information, data, understanding, and indicators to inform the decision-making process?
12. What is the status of the 33 Lake Michigan sub-watersheds? 💧

## Accomplishments

### *2010 Coordinated Field Year: Near and Off shore*

In the fall of 2008, the Lake Michigan Monitoring Coordinating Council (LMMCC) formed a Near Shore Task Force to plan for the near shore work 2010 Intensive Field Year in conjunction with the US EPA's National Coastal Conditions sampling. LMMCC has worked to coordinate and support consistent, scientifically defensible monitoring methods and collaboration for data comparability since 1999.

USEPA's Great Lakes National Program Office is responsible for monitoring the offshore water quality of the Great Lakes to evaluate water quality over time and identify any emerging water quality problems. GLNPO's R/V Lake Guardian conducts the surveys in both the spring, when the water is cold and well mixed, and in the summer, when the lakes are biologically active. The assessment includes:

### *Chemical/Nutrient Parameters*

**Phosphorus in open water**--controls algae growth, concentrations affected by sewage processes, phosphate detergents, and agricultural land uses;

**Nitrogen in open water**--important in plant growth, concentrations affected by the burning of fossil fuels;

**Silica in open water**--important in growth of diatoms, algae that form the base of the food web; and

**Chloride**--an indication of human inputs into the lakes.

### *Physical and Water Quality Parameters*

Water temperature, transmissivity, incident light, air temperature, wind speed, wave height, barometric pressure; and conductivity, dissolved oxygen, pH.

### *Biological Parameters*

**Phytoplankton and zooplankton**---important indicators of the health of the food web and indicators of lower levels of the food chain.

**Benthic Community Analyses**---important indications of the ecology of the bottom lake and potential disruptions as a result of chemicals or invading species such as the zebra mussel and quagga mussel.

### *Education, Outreach and Engagement*

- State of Lake Michigan (SOLM) and Great Lakes Beach Association Conference has been held every two years since 1999 at different locations around the basin and provides in depth presentations as well as opportunities for engagement. In September 2009, the conference drew almost 300 participants to Milwaukee, WI and the same amount of participants participating via the web conference opportunity provided.
- Every summer since 1998, the Lake Michigan Forum and Grand Valley State University (GVSU) have held On Board education and outreach sessions at harbors and AOCs around the lake. The GVSU research vessel, the WG Jackson, provides the field portion of teacher training sessions as well as informal public education. Each summer hundreds of people have access to materials, formal and informal instruction and a first hand experience with the lake's ecosystem.
- Sustainable Harbors and Marinas Initiative : Muskegon and Waukegan Harbors The Lake Michigan Forum has developed an environmental management assessment for two of Lake Michigan's many harbors and presented this to the public to encourage a dialogue between the involved industries, local government and stakeholders. Harbors, with their unique position between land and water and the government and private activities in the sensitive near shore areas are key to a sustainable Lake Michigan.
- The Lake Michigan Watershed Academy implements planning projects with consideration of the goals of the LaMP. including: development of Green Infrastructure plans; collection and development of GIS data on sedimentation and water quality; and, development of pollution prevention plans for Watersheds. This network of planning commissions has participated in a variety of webinars on these topics as well as Fish and Wildlife Habitat Restoration projects and "Incorporating Environmental Planning Considerations in Transportation Planning & Construction Projects." 💧

## Challenges

### *Battling Invasives, Protecting natives*

The Lake Michigan ecosystem has been significantly degraded in recent decades by the impacts of invasive species both on the aquatic food web and terrestrial plants in wetlands. The





impacts of zebra and quagga mussels are also thought to play a role in nutrients availability. In 2009, the Chicago Area Waterway System attracted national attention for invasive species concern when evidence of Asian Carp environmental DNA was detected above the electric barriers at entry points to Lake Michigan. Federal, state, local and Canadian agencies conducted a December 2009 eradication effort in the Chicago Sanitary and Ship Canal to achieve short term control. A dynamic document, the multi-agency Asian Carp Control Strategy Framework captures an increasing body of knowledge, on-going research and monitoring data and the ability to collaboratively discuss and plan management options and keep the public informed. [www.asiancarp.org](http://www.asiancarp.org)

Protecting natives species has provided some impressive results but the pressure remains due to habitat destruction, numerous dams and the unknowns of climate change. Reintroduction efforts of the native Sturgeon have met with success and Bald Eagles have also been returning to nest for the first time in 100 years in Milwaukee and Northwest Indiana. The challenge is to protect water quality and habitat to turn these isolated successes into a basin trend.

### Nutrients

Problems related to nutrient enrichment of the lake began to reappear in the late 1990's with the growth of cladophora algae on the west shore. In 2007 and 2008, the Lake's east shore had dead birds washing ashore and studies indicated it was due to botulism. These problems were reminiscent of the late 1960's conditions which were addressed by point source control of nutrient inputs. In 2010, the lake issues are more complex due, in part, to the mussels whose filter feeding may play a role in the nutrient cycle and a changing climate. Ongoing monitoring and research are needed to fill data gaps, enhance knowledge and provide effective management interventions.

### Lake Michigan Flyway Habitat Protection

Lake Michigan's shoreline provides a variety of plant life and habitat for resting and refueling as more than 5 million songbirds, representing over 250 species that use the Great Lakes /Mississippi flyway route extending from the Mackenzie Valley in northwest Canada, along the Great Lakes, and down the Mississippi River into Central America. In 2000, Chicago, IL became one of the first cities to sign the Urban Migratory Bird Treaty with the US Fish and Wildlife Service. The city has mapped out key areas to protect as stopover sites as well as adding additional areas when ever possible.

### Wetland Restoration and Protection Targets

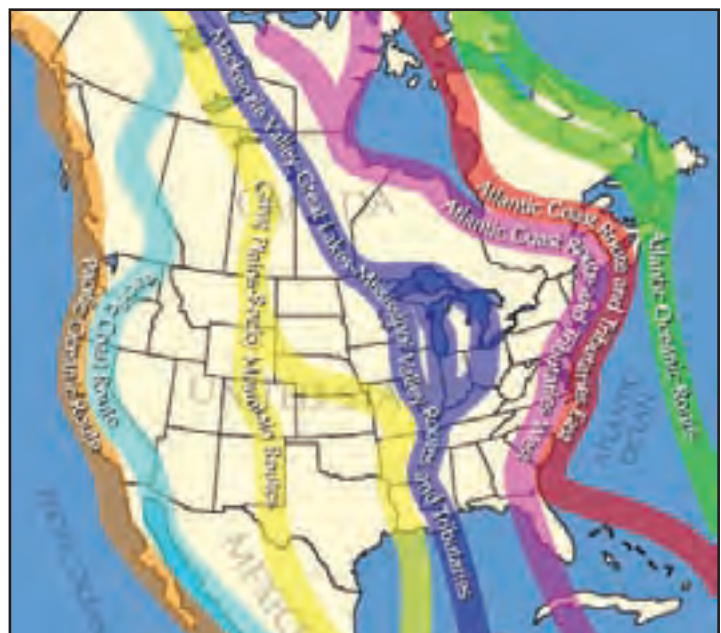
Wetland targets for enhancing and protecting these fragile and important areas were agreed to in the 2006 LaMP. The target is 125,000 acres for restoration and protection in the Lake Michigan Basin, the targets by states are: MI-89,000 , WI-30,000, IL-3,000, IN-3000. ♦

## Next Steps

### U.S. Great Lakes Restoration Initiative funds next steps projects

In October, 2009 President Barack Obama signed the \$475 million Great Lakes Restoration Initiative that provides for agency capacity and projects for the restoration and maintenance of the Great Lakes ecosystem. Funding to (the other) federal agencies through interagency agreements began in February 2010 and half of the funding awarded in competitive grants and agreements began in May, 2010. These high priority projects awarded to state, tribal, local government, academic institutions and nongovernmental organizations will accomplish the following for Lake Michigan:

- Collaboratively develop a Bio-diversity Conservation Strategy for the entire basin that identifies key habitats and protection needs and prioritizes projects;
- Facilitate the 2010 Field Year work elements and begin to plan for the follow up and assessment phase of the Cooperative Science and Monitoring Initiative;
- Facilitate the development of the Watershed Fact sheets from hard copy versions to an on-line, interactive reference tool;
- Continue the Sustainable Harbors and Marina Dialogue;
- Continue to develop and share lake and watershed specific information on Climate Change; and
- Continue the peer to peer efforts of planning commissions to provide leadership on green infrastructure issues; and
- Double the number of beach sanitary surveys and improve beach status communication. ♦



Great Lakes /Mississippi Flyway Route



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## Special Events



### Making Lake Michigan Great On Board Education Boat Tour

Milwaukee Festival, June 12,  
Muskegon, July, and  
Chicago, August 3-5, 2010  
[www.gatheringwaters.org](http://www.gatheringwaters.org)  
contact: [vailj@gvsu.edu](mailto:vailj@gvsu.edu)

### Great Lakes Beach Assoc., Annual Meeting

Erie, PA  
October 19-22, 2010  
[www.glc.org/glba10/register](http://www.glc.org/glba10/register)

### "Invasives Month" in the Lake Michigan basin

May and June, 2010  
state by state events

### Dishwashing Detergent Phosphorus Ban goes into effect in all four Lake Michigan States

July, 2010

### Area of Concern Annual Meeting

September 22, 2010  
Buffalo, NY  
contact: [mdoss@glc.org](mailto:mdoss@glc.org)

### International Beach Clean Up Day

September 25, 2010  
contact: Alliance for the Great Lakes  
[www.greatlakes.org](http://www.greatlakes.org)

### State of Lake Michigan Conference

September, 2011  
Michigan City, Indiana

## Making Progress in Areas of Concern

Under the Great Lakes Legacy Act (GLLA) funds are provided by the US Congress to clean up polluted sediment in the harbors and along the shores of the Great Lakes. USEPA can fund 65% of a project plus a required 35% non-federal match which can be any combination of state, local government and private contributions. The following Lake Michigan AOC's have been able to take advantage of this program with significant progress in PCB and other contaminants removed from the lake: The Grand Cal River in Indiana has had two GLLA projects, Roxana Marsh and the West Branch; The Kinnickinnic River in the Milwaukee, Wisconsin Estuary and Ruddiman Creek in the Muskegon, Michigan AOC. The Superfund Program is leading work on sediments in Waukegan Harbor, Illinois. For both the Kalamazoo River in Michigan and the Fox River/Green Bay in Wisconsin the Superfund program is being used for removal of chemical contamination in the sediment and the Clean Water Act's Total Maximum Daily Load (TMDL) Program for phosphorus control.

## Watershed Map



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