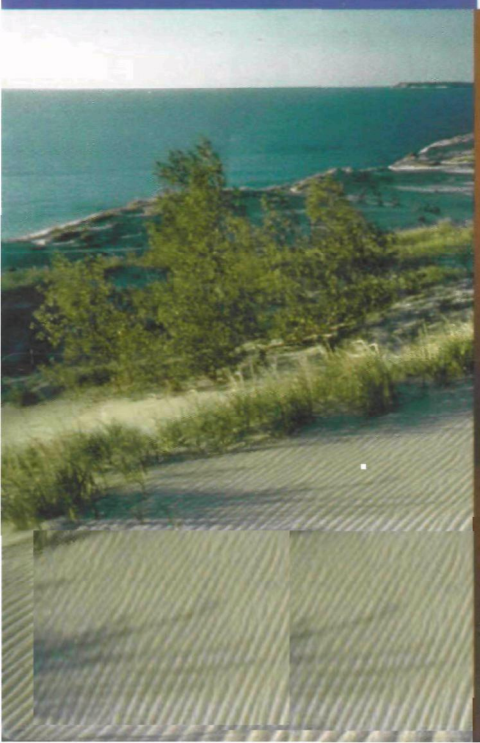
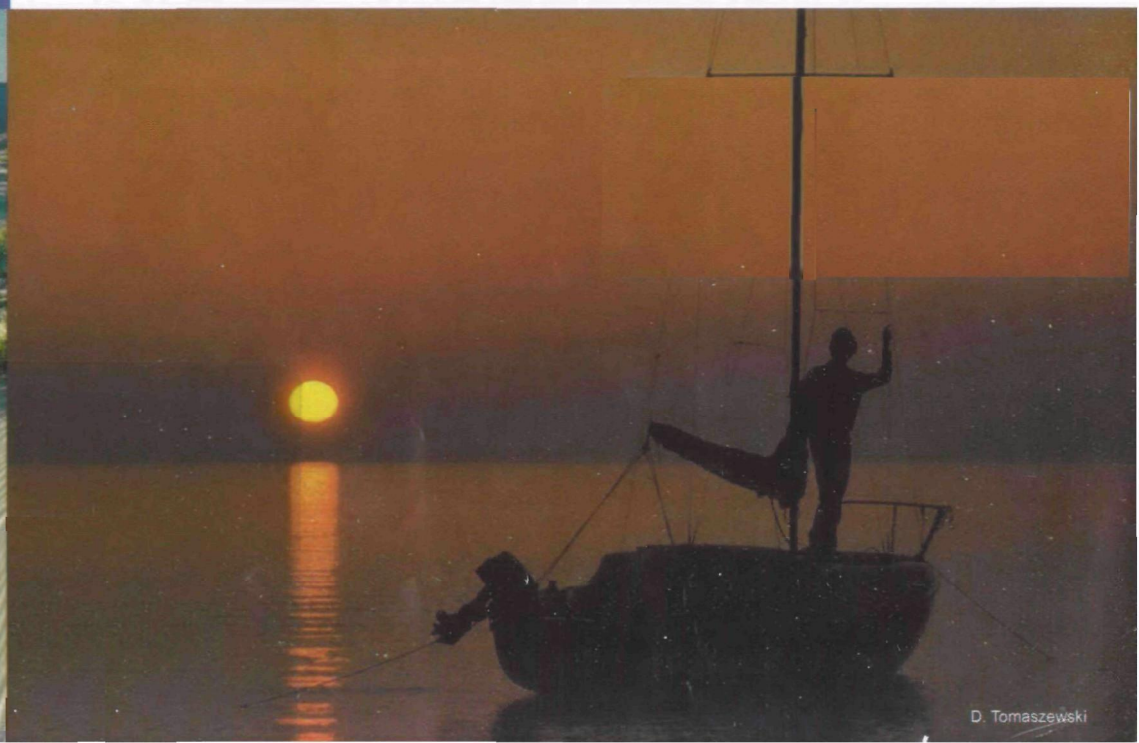
MI Travel Bureau

LAKE MICHIGAN

Lakewide Management Plan (LaMP)





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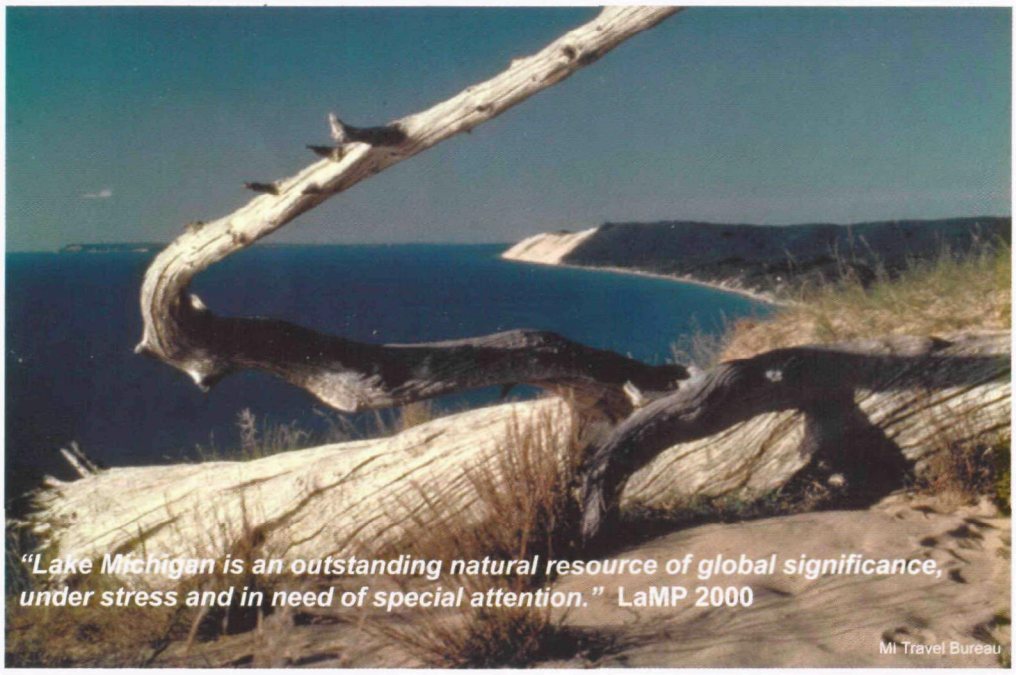

From the wave-washed beaches and dunes of the northern shore to the bustling urban-industrial communities at the southern rim, Lake Michigan represents an ecologically, culturally, and economically diverse system unparalleled in the United States. Lake Michigan, by volume, is the second largest Great Lake and the only one located totally within the United States.

What is the Lake Michigan Basin?

The Lake Michigan Basin includes the lake and the area of land where rivers and streams all drain into Lake Michigan. The lake's drainage basin covers more than 45,000 square miles and drains parts of four states: Wisconsin, Illinois, Indiana, and Michigan. Lake Michigan discharges into Lake Huron through the Straits of Mackinac at a rate that allows for a complete change of water about every 100 years. The lake forms a link in a waterway system that reaches east to the Atlantic Ocean through the St. Lawrence Seaway and south through the Chicago River locks, to the Mississippi River and on to the Gulf of Mexico.

Resources of the Lake Michigan Basin

Lake Michigan has unique conditions that support a wealth of globally rare, biological diversity, including many plant and animal species found nowhere else in the world. Lake Michigan basin's sand dunes, coastal marshes, tall grass prairies, savannas, forests, and fens all provide essential habitats for this diversity of life.

Agricultural and industrial products such as iron ore, coal, limestone, metals, petroleum, coke, and chemicals are derived from the basin's resources. The water of Lake Michigan serves many purposes. Fleets of freighters pass over the lake carrying bulk commerce items. It supports large commercial and sport fishing industries; it provides industrial process and cooling water, and water for agricultural irrigation.

Lake Michigan supports many beneficial uses. For example, it provides drinking water for 11 million people; has internationally significant habitat and natural features; supports food production and processing; supplies fish for food, sport, and culture; has valuable commercial and recreational uses; and is the home of the nation's third largest population center. Furthermore, significant progress is being made to remediate the legacy of contamination in the basin.

"Lake Michigan is an outstanding natural resource of global significance, under stress and in need of special attention." LaMP 2000

The Lakewide Management Plan (LaMP)

Under the Great Lakes Water Quality Agreement, 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, in consultation with state and provincial governments, Lakewide Management Plans (LaMPs) for open waters.

Work on the Lake Michigan LaMP began in the early 1990s with a focus on critical pollutants affecting the lake. At that time, monitoring data showed that point source regulatory controls established in the 1970s and 1980s were reducing the levels of persistent toxic substances such as polychlorinated biphenyls (PCB), DDT, and other pesticides. Monitoring results also indicated that nonpoint sources of pollution such as runoff and air deposition, as well as aquatic invasive species, were stressing the Lake Michigan ecosystem. It has been documented that core regulatory programs at the federal, state, tribal, and local levels have effectively controlled many pollutants. What remains is a set of difficult, persistent, and multifaceted problems.

Several key indicators point to the continuing concern for the health of the ecosystem, such as:

- Beach closings,
- Food web disruption,
- Invasive species impacts,
- Nuisance alga blooms,
- Habitat destruction and fragmentation,
- Fish advisories, and
- Lake and ground water level changes.

Despite these concerns, there have been several successes in the basin, such as:

- Eagles are nesting on Indiana shore for the first time in 100 years,
- Gray wolves have been removed from the endangered species list, and
- Piping plovers, hines emerald dragon fly and kirtlands warbler all have U.S. Fish and Wildlife Service recovery plans.

LaMP Vision and Goals

The LaMP provides a status report on the health of the Lake Michigan ecosystem and a summary of related activities based upon the vision, goal and subgoals of the Lake Michigan LaMP.

The vision is:

A sustainable Lake Michigan ecosystem that ensures environmental integrity and that supports and is supported by economically viable, healthy human communities.

The LaMP goal is:

To restore and protect the integrity of the Lake Michigan ecosystem through collaborative, place-based partnerships.

State of the Lake

Overall, the finding of the LaMP is that the status of achieving the goals is mixed. Some successes have been achieved – notably, drinking water quality is generally good throughout the basin– but there is much room for improvement in all the other areas.

- Over 43 percent of all Great Lakes fishing is done in Lake Michigan, being a significant contributor to the economy of the basin. While fishing is an important Lake Michigan resource, the need exists for all 4 Lake Michigan states to maintain advisories to warn the public about potential health effects resulting from consuming certain species of fish in the lake. As a result, achievement is mixed.

- The drinking water in the Lake Michigan basin is of good quality, although there have been sporadic outbreaks of illness related to drinking water. The issue of ground water depletion has been growing in importance with implications for drinking water sources and habitat.

- Lake Michigan contains the world's largest collection of freshwater sand dunes and associated beaches used for swimming and recreation. However, some areas experience episodic beach closures because of contamination due to issues such as combined sewer overflows, upstream confined animal feeding operations and stormwater runoff. As a result, the current status is mixed.

- The Lake Michigan ecosystem continues to experience profound changes because of development, impact on natural areas, impacts of invasive species, and nonpoint source pollutant loading. Overall, the status of Lake Michigan habitats is mixed to deteriorating.

- Currently, the public has access to abundant open space, shoreline, and natural areas and enhanced opportunities for interaction with the Lake Michigan ecosystem. However, the status of this issue is mixed due to the competing needs of the public and the ecosystem. There is a need to continuously find a better balance between public use and ecosystem protection.

Dave Jude

- Land use, recreation, and economic activities are more sustainable, healthy and supportive of a healthy ecosystem, but there is significant work that needs to be done. There is more information available on critical ecosystems, significant activity in better managing water resources, and determining the true value of a healthy ecosystem. There is danger, however, that the ecosystem could deteriorate if the knowledge is not shared and translated into actions.

- While regulatory and remediation programs are reducing toxic pollutant sources, ongoing air deposition, and the legacy of contamination in sediments continue to serve as sources of pollutants. As a result, the status of the toxic reduction goal is mixed.

- While there are success stories for the control of sea lamprey and the potential to prevent future introductions, zebra mussels and other invasive species continue to proliferate and are competing for food and habitat with native species. There is a danger that other new invasive species, the bighead and silver carp, could enter Lake Michigan from the Illinois River system through the Chicago River. Until the trend for invasive species is reversed, the status of this goal is mixed/deteriorating.

- Each government, institution, organization, and individual within the Lake Michigan basin has a potential role in ecosystem stewardship; however, no single government, institution, organization, or individual has the ability to implement stewardship activities and achieve sustainability in the basin

Lake Michigan Federation

unilaterally. The current status of stewardship is mixed but will improve as more Lake Michigan partnerships are formed.

- Through the LaMP comprehensive goals, specific objectives, strategic plan, and a system of indicators and monitors to judge the environmental status and effectiveness of current actions are underway. In providing these to a widespread audience, partnership and collaboration are promoted and stewardship activities increase.

- Some information sources are available to support Lake Michigan decision-makers, but there is a need to better coordinate and interpret existing data in addition to gathering more data and developing new indicators. Positive movement was achieved by not only the collaborative 2005 intensive monitoring, but also the attention to the issue as one of the Great Lakes Regional Collaboration issues. Efforts have been undertaken to gather data on wetlands, beaches, stream buffers, and other items that will ensure that the goal status changes from mixed to mixed/improving by 2010 and to good by 2020.

Lake Michigan Pollutants

One of the key functions of the LaMP process is to identify and track pollutants that are or have the potential to adversely affect the Lake Michigan ecosystem. The LaMP process for identifying three categories of Lake Michigan LaMP pollutants on a geographic basis is outlined:

- Critical pollutants,
- Pollutants of concern, and
- Watch list pollutants.

Remedial Action Plans (RAPs)

The Great Lakes Water Quality Agreement (GLWQA) also called for the development of RAPs for specific Areas of Concern (AOC). The RAPs and LaMPs are similar in that they both use an ecosystem approach to assessing and remediating environmental degradation of the 14 beneficial use impairments outlined in the GLWQA, Annex 2, and rely on a structured public involvement process. The RAP focus is a much smaller geographic area, concentrating on an embayment or stretch of a river within a single watershed. Forging a strong relationship between the LaMPs and RAPs is important to the success of both efforts. The RAPs serve as point sources discharges to the lake as a whole. Improvements in the 10 AOC areas have begun and will eventually help improve the entire lake. Cooperation between the two efforts is essential in order for LaMPs to remove lakewide impairments and for the RAP watershed to be able to restore integrity.

Highlights of Accomplishments

A number of accomplishments highlight the on-going LaMP activities, including:

- Setting targets for reduction of critical pollutants and stressors using sampling data and models,
- Bi-annual review of the LaMP list of contaminants and stressors,
- Filling data gaps, including the Lake Michigan Mass Balance Project and 2005 Intensive Monitoring,
- Identifying ecologically rich areas and habitats catalogued by watershed, and setting a target of 125,000 restored and protected wetlands,
- Developing tools to aid and increase stewardship in the basin, including watershed fatsheets,
- Providing opportunities for public involvement, public conferences and workshops for development of a Total Maximum Daily Load (TMDL) strategy, beach management, monitoring issues, and watershed management, and
- Supporting federal/state/local partnerships to implement AOC remedial action plans and coordinating them with other basin wide efforts toward clean ups, restoration and delisting.

Since 1999 during odd years, a State of Lake Michigan conference is held to inform the public and stakeholders of accomplishments under the LaMP.

Lake Michigan Partnerships

The LaMP framework is led by a technical coordinating committee (federal, state, and tribal agencies) that develops partnerships of organizations brought together to solve problems too large or complex to be dealt with by one agency with a limited mission. This approach also has the potential to leverage and direct local, state, federal, and private resources into a coordinated effort. The challenge is to create the framework for participating organizations to contribute their expertise and resources in a manner that allows all partners to participate in the decision-making on an even basis.

The Lake Michigan Stakeholder Forum

The Lake Michigan Stakeholder Forum provides input on issues from representative stakeholders of the Lake Michigan basin. In recognition that every basin resident is a "Lake Michigan Manager," the forum seeks opportunities to foster ecosystem stewardship through multi-organizational initiatives and partnerships, looking for opportunities beyond what can be achieved by government efforts. The forum has a number of responsibilities, including 1) representing the diverse interests and geography of the Lake Michigan basin and creating important communication links; 2) identifying targets of opportunities for demonstration projects; and 3) building a constituency for improving Lake Michigan.

For more information visit www.lkmichiganforum.org.

The Lake Michigan Monitoring Coordinating Council

The Lake Michigan Monitoring Coordinating Council (LMMCC) responds to the need for enhanced coordination, communication, and data management among the many agencies and organizations that conduct or benefit from environmental monitoring efforts in the Lake Michigan basin. The LMMCC provides a forum for identifying gaps and establishing monitoring priorities; exchanging information; and forming partnerships for collaborative, coordinated monitoring.

For more information visit: http://wi.water.usgs.gov/lmmcc.

The Lake Michigan Watershed Academy

The challenge of translating Lake Michigan scale watershed data and planning to local governments divided by political boundaries is being undertaken through the development of the Lake Michigan Watershed Academy. The concept of a Lake Michigan Watershed Academy is to provide a "packaging and delivery system" that brings together the tools, data, and expertise of many federal, state, local and tribal agencies, as well as nongovernmental organizations (NGOs) and environmental organizations to explore opportunities for new partnerships, thereby impacting the quality of land use plans and partners in the Lake Michigan watershed.

Science and Models: The Lake Michigan Mass Balance Project

The LMMB Project is an enhanced monitoring and modeling project that is working to develop a sound, scientific base of information to inform LaMP policy decisions. The LMMB Project's specific objectives are as follows:

- To identify relative loading rates of four different pollutants entering Lake Michigan: PCBs, mercury, transnonachlor, and atrazine,
- To evaluate relative loading rates by media (such as tributaries, atmospheric deposition, and contaminated sediments) to better target future load reduction efforts and to establish baseline loading estimates against which to gauge future progress,
- To develop the predictive ability to determine the environmental benefits of specific load reduction scenarios for toxic substances and the time required to realize those benefits through the use of models, and
- To improve our understanding of key environmental processes and how they combine to govern the movement of pollutants through the lake (cycling) and fish and plant life (bioavailability).

Data from this project will be used to drive the final LaMP load reduction schedule.

The LMMCC led the effort of ten years after the completion of the LMMB sampling effort; the Lake Michigan states and EPA agreed to resample five of the original 11 LMMB sampling sites in 2005 to generate updated load estimates. The Lake Michigan Tributary Monitoring 10-Year Anniversary Sampling Project is a result of a cooperative effort of the U.S. EPA, Great Lakes Commission, Michigan Department of Environmental Quality, Indiana Department of Environmental Management, Illinois EPA, Wisconsin Department of Natural Resources, and the U.S. Geological Survey (USGS) offices in Wisconsin and Michigan.

Sampling began in spring 2005 following ice-out and continued through summer 2006. USGS field crews sampled the following tributaries: the Lower Fox River in Wisconsin, the Grand Calumet River in Indiana, and the Kalamazoo, Grand, and St. Joseph Rivers in Michigan. Samples were analyzed for PCB congeners, heavy metals (including total mercury), nutrients, and conventional parameters. Results will be reported at the State of Lake Michigan Conference, October 2007, and the LaMP 2008.

For More Information

Lake Michigan LaMP is available on line at www.epa.gov/glnpo/michigan.html. For a CD or printed copy, contact the U.S. Environmental Protection Agency, Mail Code T-17J, 77 West Jackson Boulevard, Chicago, IL 60604.

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This project was funded, in part, by a grant from the U.S. Environmental Protection Agency's Great Lakes National Program Office.

Prepared by the Office of the Great Lakes
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Printed by authority of Department of Environmental Quality.
Total number of copies printed: 25,000; Total Cost: $4,754.42; Cost per copy: $0.19

DEQ Michigan Department of Environmental Quality