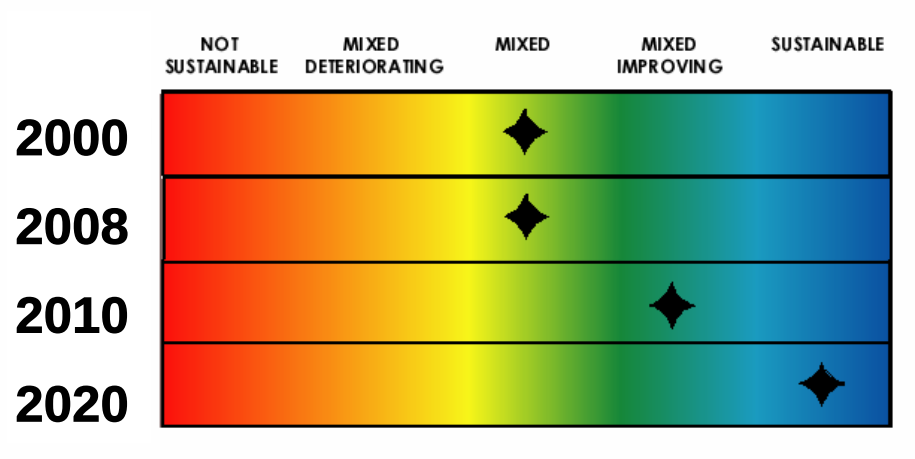
Subgoal 12
What is the Status of Lake Michigan Subwatersheds?

What is our target for sustainability?

Watershed boundaries are routinely used as the unit for planning and integrating human activities and achieving an environmental, economic, and social balance.

Lake Michigan Target Dates for Sustainability



What is the current status?

While possessing globally significant biodiversity resources, all but three of the 33 major watersheds within the Lake Michigan basin have some river and stream reaches listed as impaired.

What are the major challenges?

- Climate Change: USEPA Office of Water is working to adapt more water programs to climate change challenges at the watershed scale
- Building better understanding of the watershed approach
- Working with local communities to use watersheds as a basis for environmental decision making across political boundaries
- Providing data for the 1,467 12-digit subwatersheds.

What are the next steps?

- Make watershed fact sheets available to state, regional and watershed groups
- Identify information to develop restoration targets for each watershed and facilitate the process
- Provide accessible data at the 12-digit subwatershed level online
- Provide training on information access and developing a watershed plan
- Work with other watershed programs and efforts to leverage and integrate tools
- Utilize the Watershed Academy to expand awareness of the watershed fact sheets

Indicators (State of the Lakes Ecosystem Indicators by Number)

- Indicator # 7002 - Land Cover/Land Conversion - Lake Michigan Status: Mixed; Trend: Undetermined
- The Nature Conservancy Biodiversity Areas and Species Protected
- Stream Reaches Listed as Impaired
- Number of Total Maximum Daily Loads Completed
- Number of projects supported through the 319 grants program with successful follow through

For more information on status of indicators, see http://www.epa.gov/solec/sogl2007/

Watershed Management

The first 11 chapters of the LaMP look at specific environmental goals and issues. This chapter focuses on bringing much of that information together on a graphic and watershed basis.

Lake Michigan's 33 Tributary Watersheds

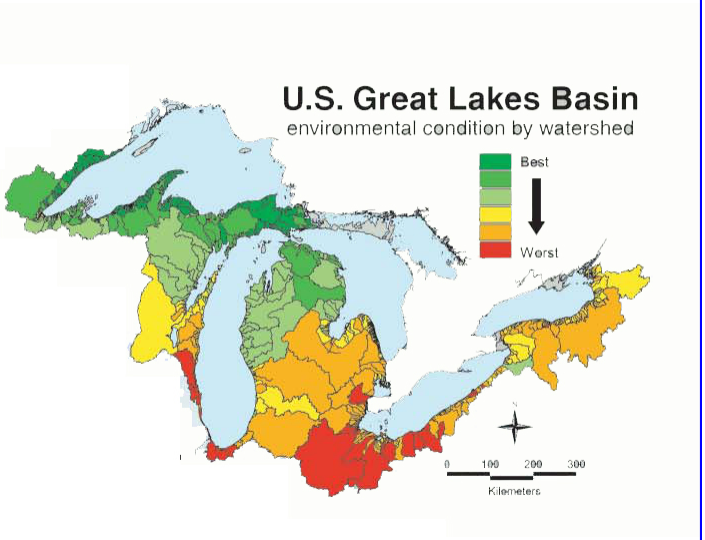
The first step in advancing work watershed by watershed is to provide available data in a watershed-based format. Lake Michigan has 33 tributary watersheds at the 8-digit hydrologic unit code (HUC) as defined by the U.S. Geological Survey (USGS). Wisconsin manages its watersheds through watershed management units that do not always correspond with USGS HUCs. Instead, they follow a combination of watershed and political boundaries. Michigan's watershed management boundaries also differ and generally use smaller watersheds.

Although a decade of effort has resulted in a general awareness of the watershed approach within EPA, recent evaluations show substantial gaps in implementation. The watershed approach should not be seen as merely a special initiative targeted at just a selected set of places or involving a relatively small group of EPA or state staff. Rather, it should be the fulcrum of our restoration and protection efforts, and those of our many stakeholders, private and public. Failure to fully incorporate the watershed approach into program implementation will result in failure to achieve our environmental objectives in many of our nation's waters.

Following are overviews of the 33 Lake Michigan tributary sub-watersheds as well as an overview of the Chicago Waterways system. They provide a picture of Lake Michigan divided into watersheds, showing the special and important elements present in the watershed as well as the impairments that currently exist. Also provided is an overview of the planning underway and the groups involved. We seek comments on these fact sheets as to their content and usefulness.

Actions to Address Feedback

Feedback on the watershed fact sheets from LaMP 2004 to the present indicates the need for more detailed information similar to the fact sheets at the 8 digit level. Work just completed in early 2008 by a



Scientists with the Great Lakes Environmental Indicator (GLEI) Project (glei.nrri.umn.edu) have developed a Condition Index that indicates the region's environmental condition by watershed. The index is based on 207 individual stressors* that fall into five dominant human-derived stresses to ecological condition: 1) type of land use, 2) amount of agricultural activity, 3) point sources of pollution, 4) atmospheric deposition, and 5) human population density. The stresses in each watershed were summarized and the resulting scores were distributed over a gradient from worst (red) to best (green) indicating the Environmental Condition of each coastal watershed, as depicted on the map of the U.S. Great Lakes basin. Using updated versions of appropriate databases and GIS techniques, managers can produce similar Condition Indexes for their area.
Source: New Index of Environmental Condition for Coastal Wetlands in the Great Lakes Basin, glei.nrri.umn.edu.

* The Geographic Information Retrieval and Analysis System (GIRAS) was developed in the mid 1970s to put into digital form a number of data layers which were of interest to the USGS. One of these data layers was the Hydrologic Units. The map is based on the Hydrologic Unit Maps published by the USGS Office of Water Data Coordination, together with the list descriptions and name of region, subregion, accounting units, and cataloging unit. The hydrologic units are encoded with an eight- digit number that indicates the hydrologic region (first two digits), hydrologic subregion (second two digits), accounting unit (third two digits), and cataloging unit (fourth two digits).

partnership of EPA, states and USGS makes it possible to list and map the 12 digit sub-watersheds in LaMP 2008. At this smaller sub-watershed level the number of watersheds and amount of data preclude development of fact sheets. Our next step is to investigate a digital and/or cd format and to determine what data are available. Some of the Lake Michigan states are working on or have similar efforts that need to be integrated.

Currently, a significant amount of data is available on line at www.epa.gov/surf and www.epa.gov/watershedwebcasts/live

Linking LaMP Goals to Effective Implementation: The Watershed Scale

The development of the LaMP holds great promise for achieving environmental improvement in the Lake Michigan basin, but it also offers significant challenges in terms of practicing environmental restoration and protection on this scale. One of the most significant of these challenges is the need for cross-program and cross-jurisdictional coordination. This includes coordination among the U.S. and Canada, between federal agencies, and among states, provinces, and tribes, as well as coordination across a variety of statutory authorities. Because of this, EPA has taken the approach of using existing tools, as well as developing new and innovative ones, in concert with federal, tribal, state, and local partners to achieve environmental results that are relevant to a given place. To simplify the myriad of statutes, regulations, and resources affecting the management of Lake Michigan, Chapter 9 of the LaMP presents the Lake Michigan Stakeholder Directory, a listing of the major governmental units, regulatory agencies, and other significant stakeholders that are responsible for managing some aspects of the Lake Michigan ecosystem. Each watershed fact sheet in this chapter also lists groups involved in watershed management.

Information from The Nature Conservancy

The fact sheets also provide information from the Nature Conservancy from their just released "Conservation Blueprint for the Great Lakes". Jointly funded by GLNPO, the Ontario Ministry of Natural Resources, the Gund Foundation, the Charles Stewart Mott Foundation, the Richard Ivey Foundation, and the Living Legacy Trust, the blueprint was a binational, collaborative effort to identify areas of biodiversity significance throughout the Great Lakes basin.

A total of 501 places were identified, mapped, and inventoried, and an analysis of threats to each place conducted by more than 200 scientists from federal and state/provincial agencies and private organizations. The results are impressive: the basin contains 46 species found nowhere else in the world and 279 globally rare plants, animals and natural communities in a region of boreal, mixed and deciduous forests, tallgrass prairies, wetlands, sand dunes, alvars and islands. The areas are critical to the preservation of biodiversity and represent the best opportunities to preserve species, natural communities and ecological systems. For each area, the blueprint contains information about Great Lakes species, natural communities and ecological systems; maps of where conservation is underway; summaries of current projects and strategies; information on threats to biodiversity; and, detailed descriptions of plans. The blueprint also offers actions that can be taken to protect these areas.

The Nature Conservancy is making this information available to the Great Lakes Regional Collaboration for use in Great Lakes indicator and habitat protection and restoration work. The Conservation Blueprint is available online at: http://nature.org/wherewework/northamerica/greatlakes/files/conservation_blprnt_final.pdf.

Lake Michigan Overview

- Lake Michigan, the second largest Great Lake by volume with just under 1,180 cubic miles of water, is the only Great Lake entirely within the United States.
- Approximately 118 miles wide and 307 miles long, Lake Michigan has more than 1,600 miles of shoreline.
- Averaging 279 feet in depth, the lake reaches 925 feet at its deepest point.
- It has a water surface area of 22,300 square miles. The drainage basin, approximately twice as large as the 22,300 square miles of surface water, includes portions of Illinois, Indiana, Michigan and Wisconsin.

- On average, a molecule of water will spend 100 years in Lake Michigan before exiting to Lake Huron at the Straits of Mackinac.
- The lake's northern tier is in the colder, less developed upper Great Lakes region, while its more temperate southern basin contains the Milwaukee and Chicago metropolitan areas.

Additional Lake Michigan overview information on the following pages is an excerpt from the State of the Lakes Ecosystem Report. This is followed by the fact sheets on the individual subwatersheds.

Locations of The Nature Conservancy's Areas of Biodiversity
Source: The Nature Conservancy

3.6 Lake Michigan

Assessment: The physical integrity of the Lake Michigan ecosystem is *mixed.*

"Lake Michigan is an outstanding natural resource of global significance, under stress and in need of special attention" (Lake Michigan LaMP 2000). Since the original 2000 assessment, there has been both positive and negative change in the Lake Michigan basin. Positive work includes sediment clean ups, the purchasing of large land parcels for preservation purposes, and the rebounding of terrestrial species. Some negative changes include continued pressure from invasive species on the aquatic food web and land development in the near coastal areas.

Background Summary

Lake Michigan is one of the most complex ecosystems of the Great Lakes due to its length of 307 miles (494 km). It varies from north woods forest to southern dune and swale environments. The largest collection of fresh water sand dunes in the world is a prominent feature, as are Lake Michigan's islands which are grouped into two northern archipelagoes of 19 Grand Traverse Islands and Beaver Islands. Many of the islands have suffered a loss of natural habitat due to development and are moderately degraded. Several of the Beaver Islands are part of the Michigan Islands National Wildlife Refuge providing 235 acres (95 ha) of habitat for migratory and colonial nesting birds and federally threatened plants like dwarf iris and Pitcher's thistle. There are three islands totalling 29 acres (12 ha) in the Green Bay National Wildlife Refuge that offers similar habitats. Underwater reefs in both the nearshore and offshore are thought to play an important role in Lake Michigan spawning.

Lake Michigan is the second largest Great Lake by volume and

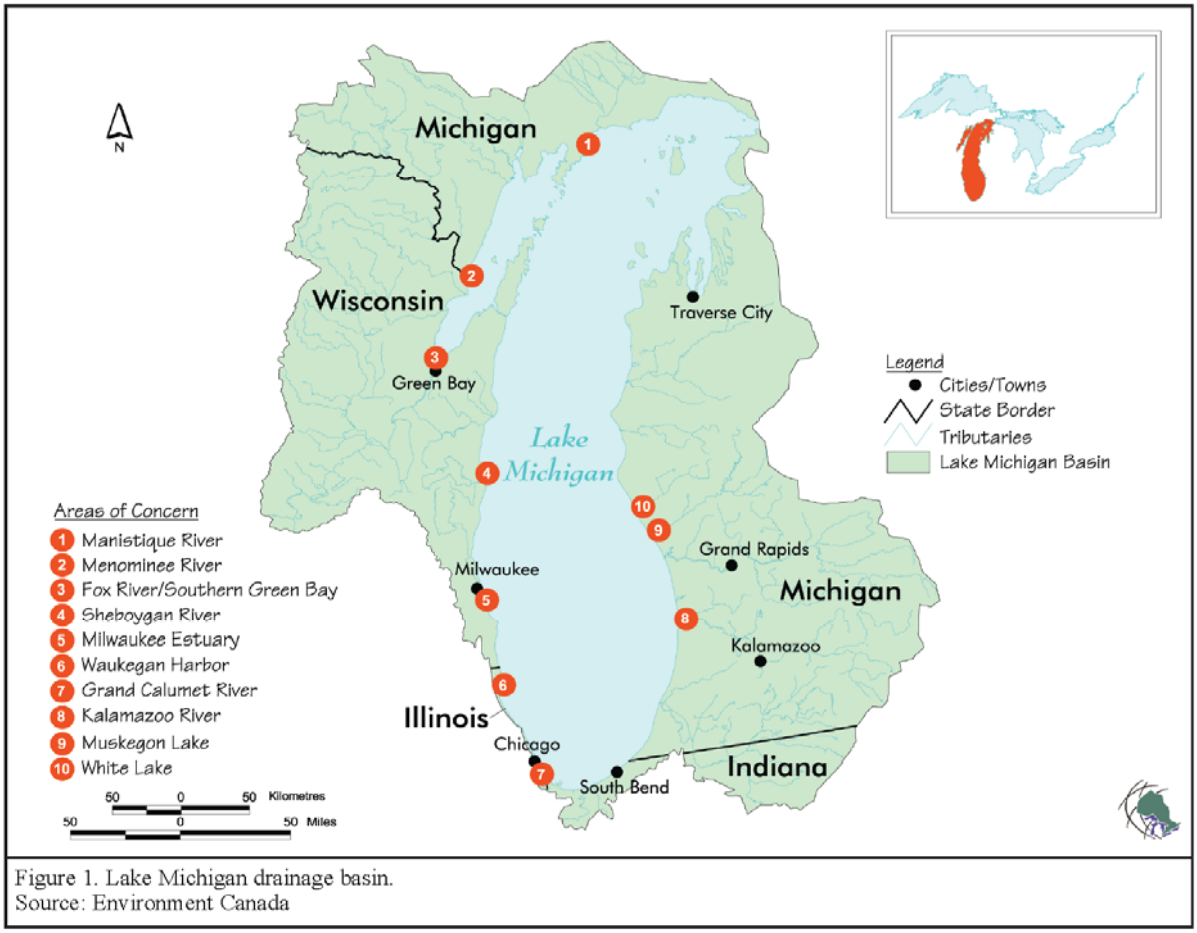


Figure 1. Lake Michigan drainage basin.
Source: Environment Canada

contains over 20% of the Great Lakes' coastal wetlands which are responsible for the quantity and diversity of aquatic life seen in the lake. Protection and enhancement of these areas are key to the future sustainability of the coastal ecosystem.

Lake Michigan is uniquely positioned with a direct connection to the Mississippi River System through the Chicago Diversion, and as such, has become a transfer point for many non–native species which threaten the biological integrity of all the Great Lakes and the Mississippi River.

Lake Michigan has 33 8–digit hydrologic unit code (HUC) tributary watersheds, with all but three listed as impaired and 10 estuaries designated as Areas of Concern (Figure 1). Many Michigan and Wisconsin tributaries have been dammed in the past, but recent dam removals in southeastern Wisconsin have resulted in improved fish habitat, water quality and diversity of species including the appearance of the rare greater redhorse in the Milwaukee River.

Over 10 million people are dependent on Lake Michigan for high quality drinking water and recreation. Since the passing of the U.S. Beaches Environmental Assessment and Coastal Health (BEACH) Act in 2000, the four Lake Michigan states are on track for implementing these provisions with an average of 50% more monitoring using enhanced water quality standards. The results have led to increased advisories and the need for studies to determine contamination sources and management options.

Groundwater Flow

Groundwater beneath the Great Lakes has a different and changeable divide than the Great Lakes surface/watershed divide. In the Great Lakes basin, most shallow flow discharges to local streams; the Great Lakes watershed divide (i.e. the sub–continental divide) also serves as a groundwater divide for shallow flow. Most deep flow discharges are to regional sinks with the deep aquifer divide being distant from the surface watershed divide (Figure 2).

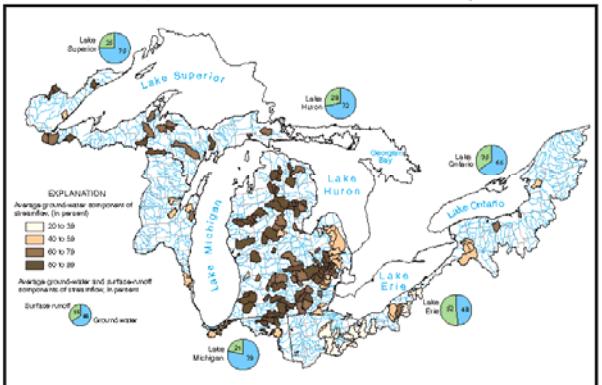


Figure 2. Average groundwater and surface runoff components of selected watersheds in the U.S. portion of the Great Lakes basin.
Source: Holtschlag and Nicholas, 1998

Groundwater divides move in response to pumping. Studies from the western Lake Michigan groundwater basin report that the 1950 pre–development divide and the year 2000 divide for the deep bedrock aquifer, show a pattern of movement. The western basin groundwater that once flowed east toward Lake Michigan is now intercepted by pumping and diverted west under the surface–water divide.

Groundwater, once used, can be discharged to surface water bodies in a different basin. Since the late 1940s, development on the Mississippi basin side of the sub–continental divide has reversed deep flow patterns between west of the divide and the Milwaukee area. The groundwater levels are low enough that Lake Michigan can migrate into the groundwater, a reversal of the normal flow (U.S. Geological Survey 1998).

Groundwater's Role in the Health of the Lake Michigan Ecosystem

The Great Lakes are in a topographically low setting that, under natural flow conditions, causes them to function as discharge areas or "sinks" for the groundwater–flow system. Most groundwater that discharges directly into the lakes is believed to take place near the shore (Grannemann and Weaver 1999). Of all the Great Lakes, Lake Michigan has the largest amount of direct groundwater discharge (2,700 ft^3/s or 76 m^3/s) because it has more sand and gravel aquifers near the shore than any of the other Great Lakes (Grannemann and Weaver, 1999). Although this is a relatively low inflow compared to the total stream flow into the lake from land areas (41,200 ft^3/s or 1167 m^3/s) (Croley and Hunter 1994), it is nearly equal to the amount of water diverted from Lake Michigan through the Chicago Ship and Sanitary Canal (Table 1) (Oberg and Schmidt 1994).

Lake	Overlake Precipitation (percent)	Surface-Runoff (percent)	Indirect groundwater discharge (percent)
Superior	56.3	11.0	32.7
Michigan	56.2	9.3	34.5
Huron	42.2	16.3	41.5
Erie	53.5	24.3	22.2
Ontario	34.8	22.8	42.4

Table 1. Basin water supply for the Great Lakes.
Source: U.S. Geological Survey, 1998. Water Supply Paper

Groundwater Provides Refuge for Aquatic Organisms

Groundwater discharge to streams may help provide important habitat for aquatic organisms, including fish. In addition, because groundwater temperatures are nearly constant throughout the year, stream reaches with relatively large amounts of groundwater discharge can provide refuge to organisms from heat in summer and from cold in winter. For example, some stream reaches in the region remain unfrozen even though air

temperatures are well below 32 degrees Fahrenheit (0 degrees Celsius). Other possible benefits to the survival of aquatic organisms related to groundwater discharge to streams include increasing concentrations of dissolved oxygen, adding small amounts of nutrients that are essential to the health of organisms, providing cold pockets of water in summer, and maintaining stream flow during dry periods.

Lake Levels

Lake Michigan's water level was measured at 2 feet (61 cm) below the long–term average in 2001, having dropped more than 40 inches (102 cm) since 1997 when it was at near record highs. Levels increased for 2002, but were still below average. The decrease in precipitation over the last five years resulted in Lake Michigan being at its lowest point since 1966. Lake levels rose between the mid–1960s and the late 1990s.

The lower lake level has caused problems for the shipping and boating industry. Cargo ships were forced to lighten their loads, and many boat ramps became inaccessible. According to the U.S. Great Lakes Shipping Association, for every inch (2.5 cm) of water that Lake Michigan loses, a cargo ship must reduce its load by 90 to 115 metric tons, leading to losses of between $22,000 and $28,000 U.S. per trip.

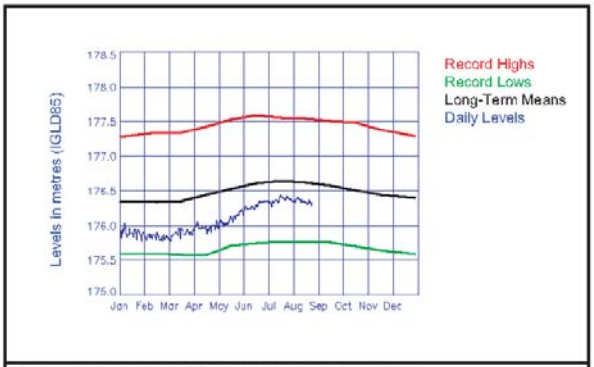


Figure 3. Lake Michigan-Huron water levels.
Source: Great Lakes Environmental Research Laboratory-National Oceanic and Atmospheric Administration

Early reports for 2004 indicated that the lake level was at an average depth due to increased rainfall early in the year. The lake measured one foot higher (30.5 cm) in the summer of 2004 than 2003 with the mean average of 579 feet or 176 metres. This fluctuation may be part of a 30–year cycle that deserves continued monitoring (Figure 3). (U.S. ACE, Detroit District)

Beaches

Lake Michigan contains the world's largest collection of fresh-water sand dunes and associated beaches, particularly along its eastern shore. Of a total of 3,100 acres (1,255 ha) along the coast, 1,200 acres (486 ha) are publicly owned and available for use, while another 1,200 acres (486 ha) are privately owned and have significant potential for public use. In addition to swimming advisories due to poor water quality, there has been a resurgence of the macro algae *Cladophora* along the coast. *Cladophora* blooms result in reduced water quality and beach use. Causes of this problem may be attributed to multiple factors, such as lower lake levels, increased water temperature, nearshore nutrients and zebra mussel activity (Great Lakes Water Institute, University of Wisconsin at Milwaukee).

Aquatic Food Web

The Lake Michigan aquatic food web is threatened due to invasive species competing for food and changing the physical environment (Figure 4). Zebra mussels have the ability to filter water allowing sunlight to penetrate to greater depths, possibly causing algae blooms. The invertebrate *Diporeia* is decreasing rapidly in Lake Michigan thus removing a foundation component of the food web (Figure 5). The yellow perch population remains low and zebra mussels, first introduced in 1989, have shown a decline in certain areas. Sea Lamprey populations have increased in abundance and are now higher than in Lakes Superior or Huron. Lake Trout are stocked and have not recovered to the point of natural reproduction in the lake.

Lake Sturgeon survive in the Great Lakes only in scattered remnants, even though large scale commercial fishing for them ended a century ago. There were remnant populations known to spawn in the waters of 8 tributaries with connections to Lake Michigan. In 2003, enhanced stocking was undertaken with the hopes that the stocked sturgeon would flourish, but not genetically impact the small remnant native population. There are currently 16 agencies and institutions involved with Lake Sturgeon monitoring and investigations are coordinated by the U.S. Fish and Wildlife Service Great Lakes Basin Ecosystem Team.

The most dramatic threat to Lake Michigan is from the Asian carp species which is working its way up the Illinois waterway system from the Mississippi River. The Asian carp was reported to have escaped from aquaculture ponds adjacent to the Mississippi River in the 1980s and the 1990s. An experimental electrical barrier is currently in place. Improvements to this barrier as well as an additional barrier are planned. This large carp species weighs up to 90 pounds (41 kg) and is considered a major threat to the Great Lakes food web.

Other Species

Land–based species are fairing better. The grey wolf is now listed as a recovered species and bald eagles have nested in the area of the Little Calumet River for the first time in 100 years.

Kirtland's warbler, piping plover, Hine's emerald dragonfly and the Karner blue butterfly all have recovery plans in place. An aggressive program to train whooping cranes to migrate and return to Wisconsin's wetlands (west of Lake Michigan) for future nesting is underway.

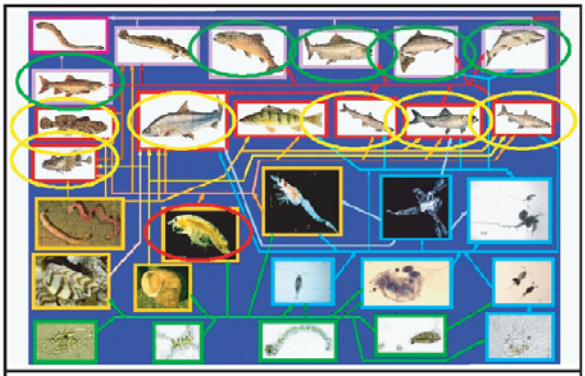


Figure 4. Lake Michigan foodweb. *Diporeia*, central in the diagram, was historically an important food for the fish on the second line of the figure (species in the red squares). *Diporeia* are the prey for the large predator fish like salmon and lake trout at the top of the chart and foodweb (species in the purple squares). Non-native species are competing with, and possibly replacing the *Diporeia* in the Lake Michigan ecosystem. The loss of *Diporeia* threatens the species that feed upon it and the whole foodweb.
Source: Mason, Krause and Ulanowicz, 2002

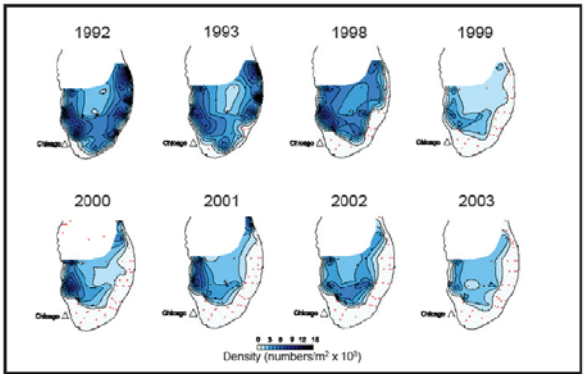


Figure 5. *Diporeia* density.
Source: Great Lakes Environmental Research Laboratory-National Oceanic and Atmospheric Administration

Natural Areas

The dune and swale systems of the eastern lakeshore are a dominant feature of Lake Michigan and provide unique habitat that foster biodiversity. While afforded some protection under law, this system faces extreme pressure as it is a sand product for industry. This area also has development pressures in the coastal communities.

Wetlands, which naturally help control runoff from urban areas by storing flood and surface water and slowly release and filter it, have been destroyed in the Lake Michigan basin states to a greater degree than elsewhere in the country. An estimated 21.9 million acres (8.9 million ha) of wetlands or 62.9% have been lost. An estimated 12.9 million acres (5.2 million ha) of wetlands remain in the four Lake Michigan states, equivalent to approximately 12.3% of the wetland area in the lower 48 states. While this percentage is for the U.S. states not just the Lake Michigan basin, it is indicative of the pressure on the wetland systems. Wetland status in the Lake Michigan basin is therefore mixed (Dahl 1990).

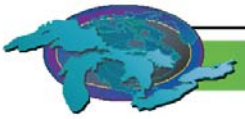
Forest status in the basin is good due to revisions to national forest plans (September 2003 U.S. Federal Register Notice) and the continued practice of sustainability forestry management by the Menominee Tribal Enterprises. The new forest plans address old growth management issues. The Menominee Reservation 235,000 acres (95,102 ha) of forest land represent 150 years of sustainable forest practice in the Wisconsin portion of the Lake Michigan basin.

Lakeplain system of prairies and savannas found in the southern part of the basin are two of the most imperiled ecological communities in North America. Alvars, open areas of thin soils over bedrock found in the northern basin, provide habitat for a number of rare plants and animals. Both of these systems are facing fragmentation and destruction due to land use development.

Pressures on the System

The 10 Areas of Concern in the Lake Michigan basin have contaminated sediment problems and either combined sewer overflows (CSO) and/or storm water problems. All 10 AOCs had some remedial sediment work completed with much more remediation still required. For most of the sediment sites and CSOs there are plans in place but implementation is often forecasted for the year 2020 or beyond. PCBs are the main contaminant in sediment and fish consumption advisories are in place around the lake thus keeping the assessment for fish communities in the Lake Michigan basin as mixed.

The urbanized land area in the United States has quadrupled since 1954. To compound the problem, populations in coastal areas, which contain some of the most sensitive ecosystems, have been increasing even faster than in the rest of the country. From 1982 to 1996, the population in the Chicago–Northwest Indiana area grew by 10.9% but consumed 44.2% of the land (Urban Roadway Congestion: Annual Report 1998). The



Northeastern Illinois Planning Commission's portion of the area is estimated to grow by 21% from 2000 to 2030. This growth pattern is similar to other growth areas around the lake and will further tax water infrastructure and resources.

USEPA's Office of Environmental Information states "the construction of impervious surfaces such as roads and rooftops leads to the degradation of water quality by increasing runoff volume, altering regular stream flow and watershed hydrology, reducing groundwater recharge, and increasing stream sedimentation and water acidity." A one acre (0.4 ha) parking lot produces a runoff volume 16 times as large as that produced by an undeveloped meadow. Many impervious construction materials have higher surface temperatures that may cause ambient air temperatures to rise. When combined with a decrease in natural vegetation, areas are subject to the "urban heat island" phenomenon, which may increase utility bills, cause health problems associated with heat stress, and accelerate the formation of harmful smog. Clearly the effect of urban development on our communities and environment is a cross–cutting issue.

Both the urban and agricultural uses of the land impact the lake. The Lake Michigan Mass Balance Study has modelled the pesticide atrazine in the basin and a draft report and models have determined the need for over a 50% annual reduction in loadings from agriculture lands and the air in order to keep this pesticide at a steady state in the lake. While nutrient levels are increasing in the nearshore areas due to urban runoff, these levels are not at concentrations of concern in the open lake.

Management Actions

For a lake the size and complexity of Lake Michigan, it is not surprising that there are some measures of improving conditions as well as measures of deteriorating conditions. As some issues approach resolution, other new issues are developing such as chemicals of emerging concern and new invasive species. Since the overall status of the lake involves the interactions of chemical, physical and biological changes, it is necessary to understand the interactions of how improvements in one of these categories will affect the other conditions in the lake.

There are many research and reporting needs required for Lake Michigan which include:

- determining the groundwater status, mapping and groundwater and surface water interactions;
- identifying sources of *Cladophora and E. Coli* including the interactions between physical and biological forces which affect the health of Lake Michigan beaches;
- tracking invasive species and their impact on the food web and natural areas;
- identifying protected natural areas, ground areas below flyways, unique features and wetlands and educating the public

Lake Michigan Statistics	
Elevation[a]	
feet	577
metres	176
Length	
miles	307
kilometres	494
Breadth	
miles	118
kilometres	190
Average Depth[a]	
feet	279
metres	85
Maximum Depth[a]	
feet	925
metres	282
Volume[a]	
cu.mi.	1,180
km^3	4,920
Water Area	
sq.mi.	22,300
km^2	57,800
Land Drainage Area	
sq.mi.	45,600
km^2	118,000
Total Area	
sq.mi	67,900
km^2	175,800
Shoreline Length[b]	
miles	1,638
kilometres	2,633
Retention Time	
years	99
Population: USA (2000)[c]	15,351,202
Totals	15,351,202
Outlet	Straits of Mackinac

[a] measured at low water datum
[b] including islands
[c] 2000 population census data were calculated based on the total population of each county, either completely or partially, located within the watershed.

Sources:
The Great Lakes: An Environmental Atlas and Resource Book

Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System and Censuses of Population 2001.

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about these areas and;
- modelling and GIS training for local officials to assist with land use decision making.

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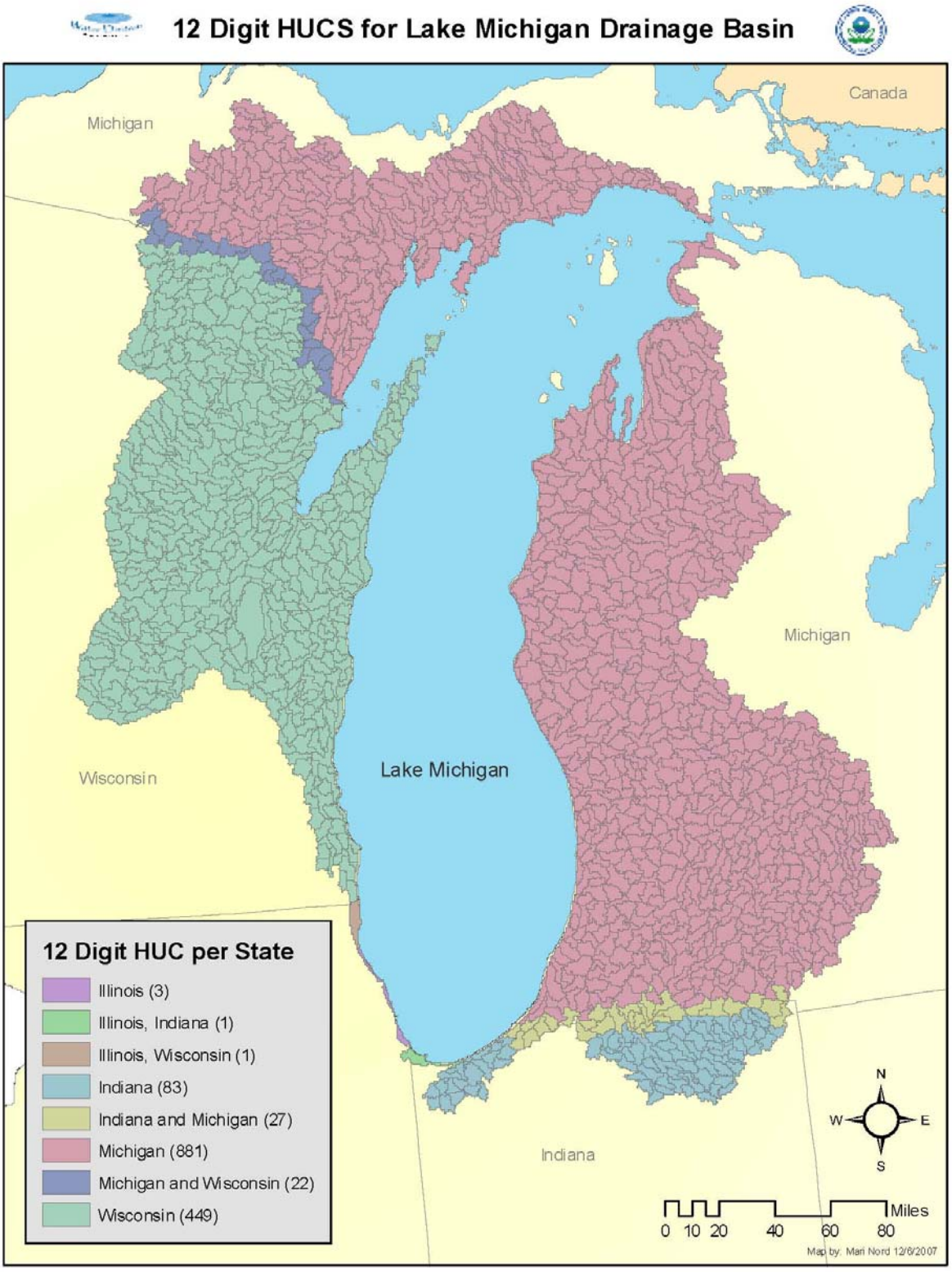
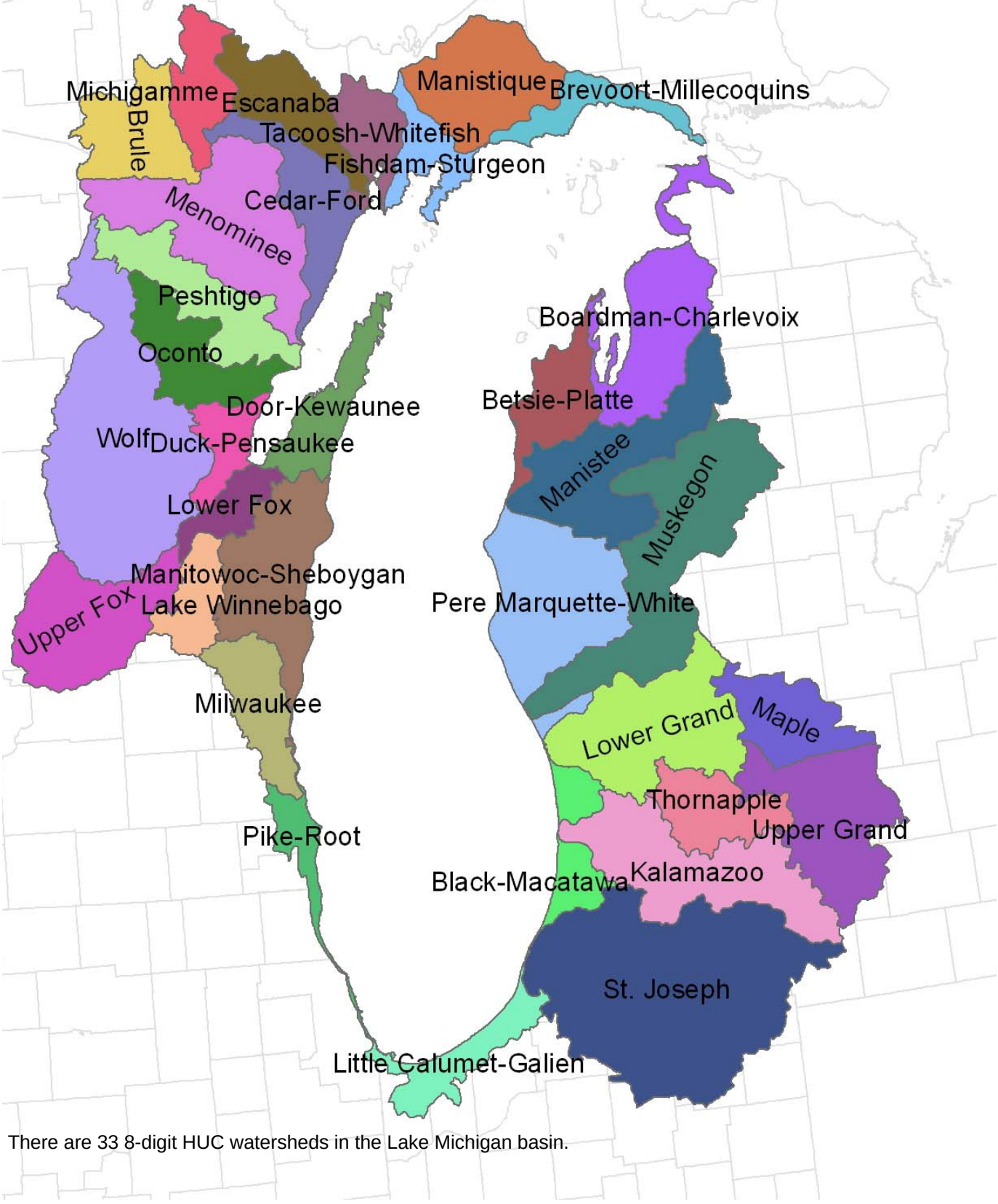
U.S. Environmental Protection Agency's Office of Environmental Information. http://www.epa.gov/oei, last accessed June 9, 2005.



There are 1,4,67 12-digit HUC watersheds in the Lake Michigan basin.

8-Digit HUCs for the Lake Michigan Watershed



There are 33 8-digit HUC watersheds in the Lake Michigan basin.

Lake Michigan 8-Digit HUC Watersheds

Watershed	HUC Code
Betsie-Platte	04060104
Black-Macatawa	04050002
Boardman-Charlevoix	04060105
Brevoort-Millecoquins	04060107
Brule	04030106
Cedar Ford	04030109
Chicago Area Waterway System	
Door-Kewaunee	04030102
Duck-Pensaukee	04030103
Ecsanaba	04030110
Fishdam-Sturgeon	04030112
Lower Fox (AOC)	04030204
Upper Fox	04030201
Lower Grand	04050006
Upper Grand	04050004
Kalamazoo (AOC)	04050003
Little Calumet-Galien (AOC)	04040001
Manistee	04060103
Manistique (AOC)	04060106
Manitowoc-Sheboygan (AOC)	04030101
Maple	04050005
Menominee (AOC)	04030108
Michigamme	04030107
Milwaukee (AOC)	04040003
Muskegon (AOC)	04060102
Oconto	04030104
Pere-Marquette-White (AOC)	04060101
Peshtigo	04030105
Pike-Root (Waukegan) (AOC	04040002
St. Joseph	04050001
Tacoosh-Whitefish	04030111
Thornapple	04050007
Lake Winnebago	04030203
Wolf	04030202