

Lake Michigan LAMP Partnership Update

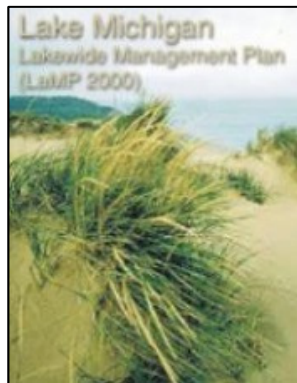
John Masterson - WDNR



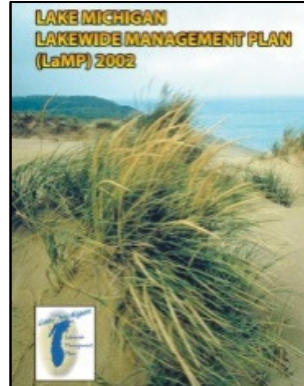
Photo Credit: WI DNR

Lakewide Management of Lake Michigan Great Lakes Water Quality Agreement

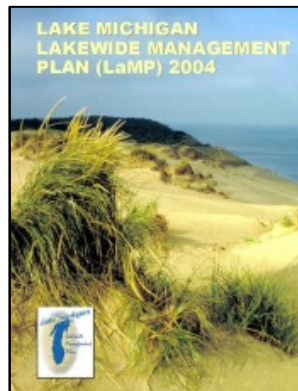
- 1987 GLWQA called for Lakewide Management Plans (LaMPs) to be developed for each Great Lake
 - ❖ To embody a systematic and comprehensive ecosystem approach to restoring or protecting beneficial uses in open lake waters
- First LaMP released in 2000
- Future **LaMPs** to be more action-oriented!



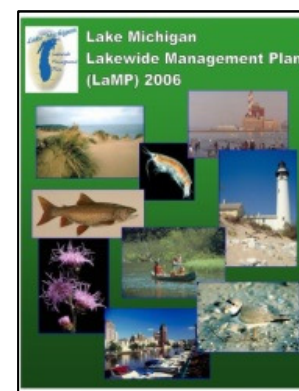
2000



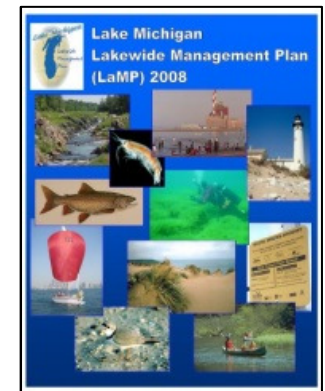
2002



2004



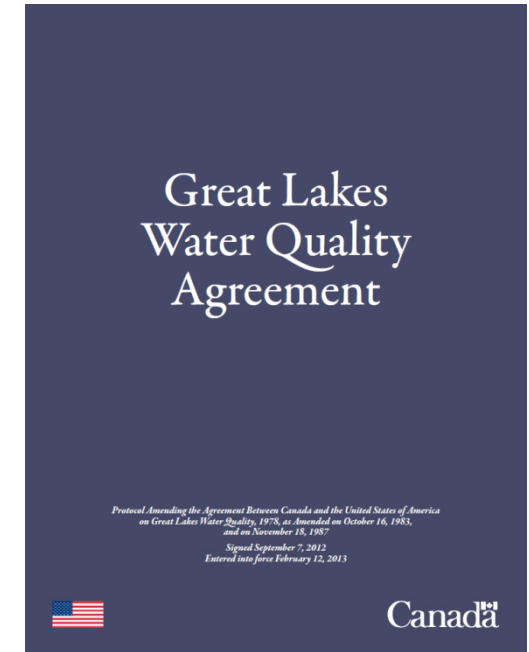
2006



2008

Lakewide Management of Lake Michigan Great Lakes Water Quality Agreement

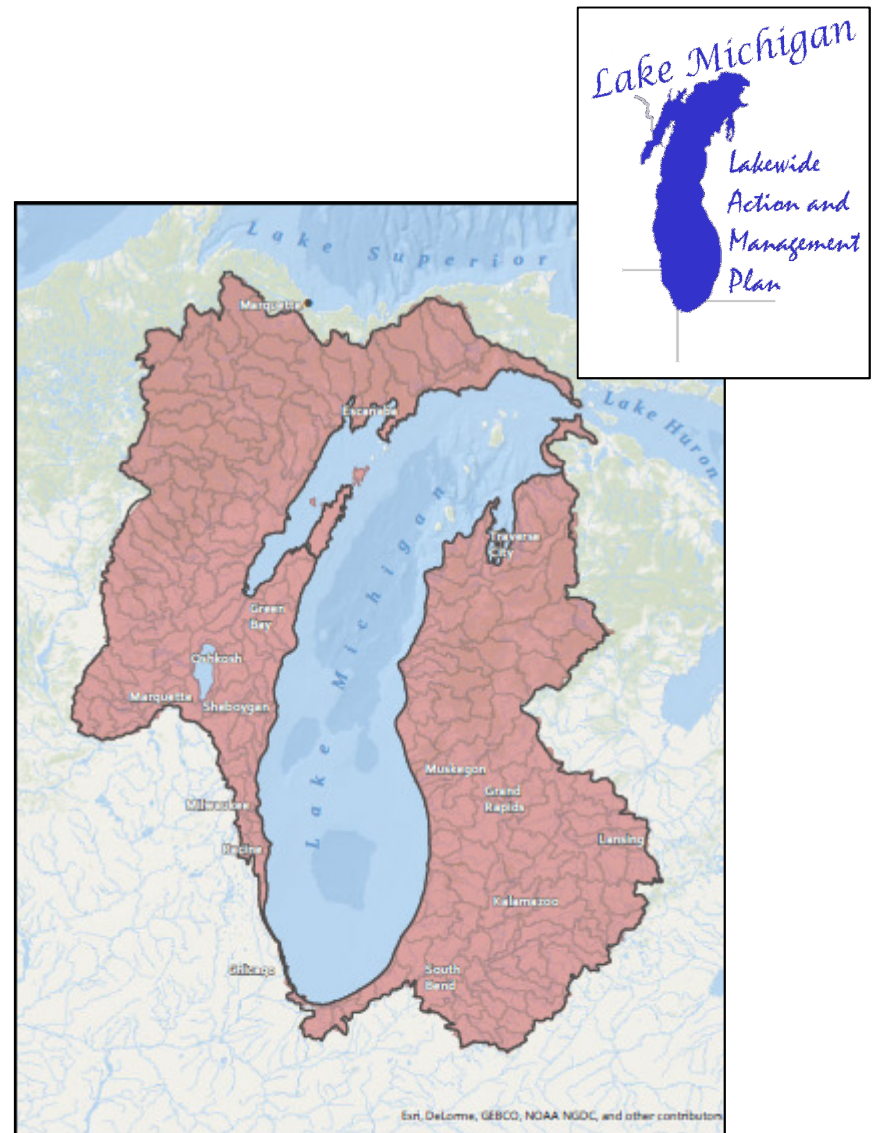
- 2012 GLWQA
 - ❖ Renewed commitment to lakewide management (Annex 2)
 - ❖ Increased emphasis on the nearshore (Annex 2) and nutrients (Annex 4)
 - ❖ LAMPS are to be blueprints for action that identify and prioritize desired restoration and protection activities



Lakewide Management of Lake Michigan

The Lakewide Action and Management Plan

- A long term ecosystem-based framework for the management of Lake Michigan
- Spatial scope: Lake Michigan proper including nearshore areas, embayments and river mouths
- Environmental influence may occur anywhere within the watershed or from outside
- Lake Michigan LAMP is due in 2019



Lakewide Management of Lake Michigan

The Lake Michigan Partnership

- The LAMP is developed and overseen by the Lake Michigan Partnership
- Led by the U.S. EPA, U.S. government agencies, and tribes working collaboratively to understand lake conditions, stressors and identify actions

Management Committee*



US EPA (chair), USGS, USFWS, USDA, USACE, NOAA, NPS, MI DEQ, WI DNR, IL DNR, IN DEM, CORA, City of Milwaukee, Michigan City

Work Group*



US EPA (chair), USGS, MI DEQ, WI DNR, IL DNR, IN DEM, CORA, Little Traverse Bay Bands of Odawa Indians

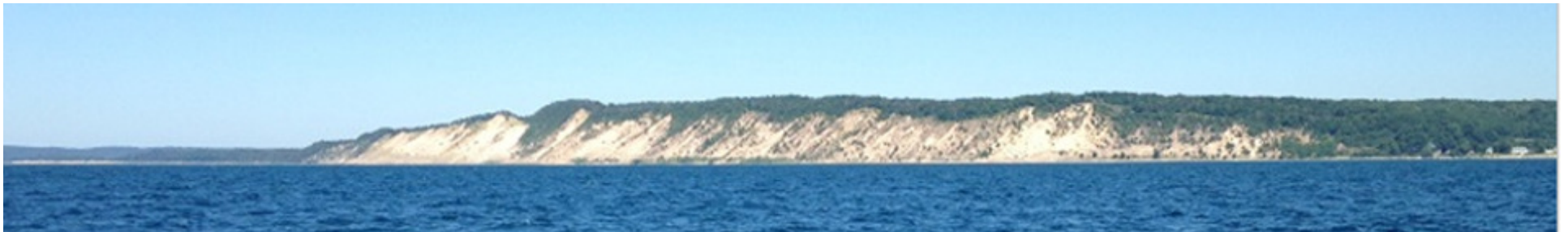
Subcommittees (*Standing or Ad Hoc*)

*Observers: IJC, BIA

Lakewide Management of Lake Michigan

The Lake Michigan Partnership

- Roles of the partnership:
 - Developing and overseeing the LAMP
 - Report on existing scientific information
 - Assessing state of the lake
 - Setting lakewide priorities and lake ecosystem objectives (LEOs)
 - Coordinating action for protection and restoration



Lakewide Management of Lake Michigan

What's Coming?

- Lake Michigan LAMP due in 2019
 - State of the Lake
 - Identification of priority threats
 - Priority actions and projects
- **LEOs being developed (2017)**
- Science reporting workshop at State of Lake Michigan conference (Green Bay, November 6-10, 2017)
- Science priorities workshop (Fall 2018)
- 2016 Annual Report (Sept), 2017 Annual Report (Sept)



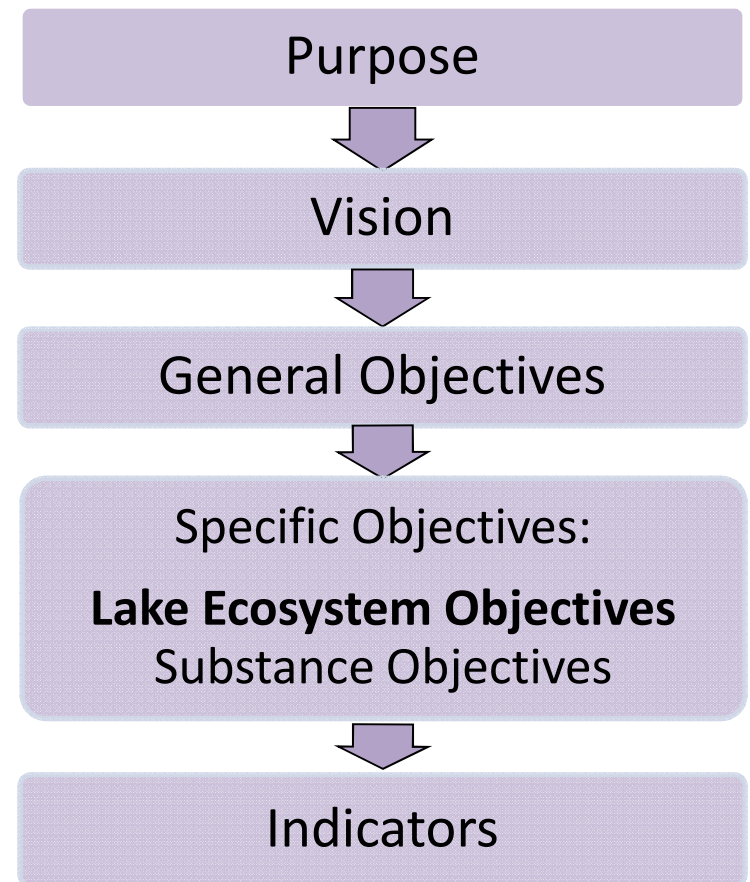
Lakewide Management of Lake Michigan GLWQA General Objectives

- 1. Safe, high-quality drinking water**
- 2. Allow for unrestricted swimming and other recreation**
- 3. Allow for unrestricted consumption of fish and wildlife**
- 4. Free from pollutants that could be harmful to human health, wildlife, or aquatic organisms**
- 5. Healthy and productive wetlands and other habitats**
- 6. Free from nutrients in amounts that interfere with aquatic ecosystem health or human use**
- 7. Free from invasives that adversely impact water quality**
- 8. Free from harmful impact of contaminated groundwater**
- 9. Free from substances, materials or conditions that may negatively impact chemical, physical or biological integrity**

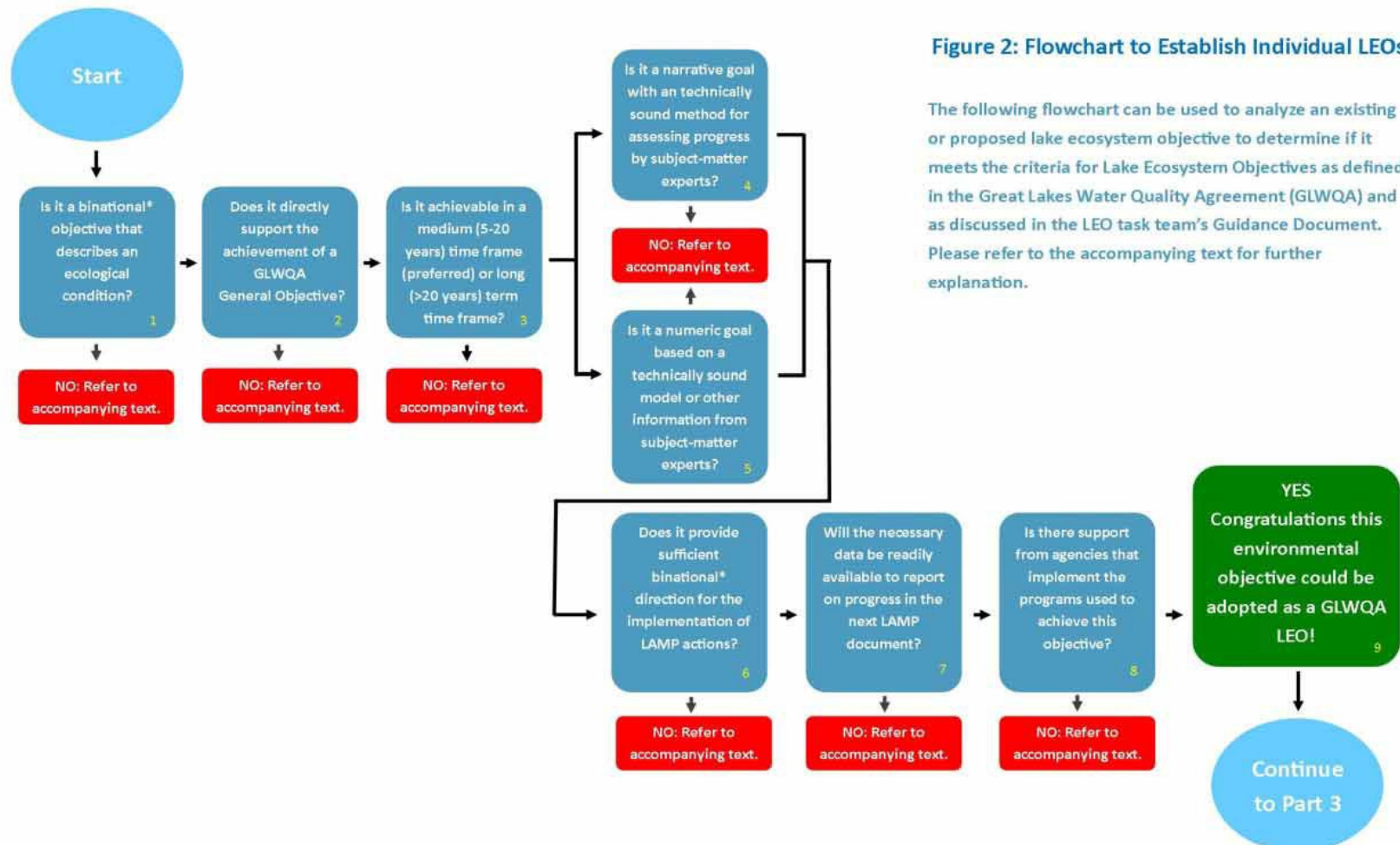
Lakewide Management of Lake Michigan Lake Ecosystem Objectives

- Benchmarks to assess status and trends in water quality and ecosystem health
- Support achievement of the General Objectives
- Established for each Great Lake and its connecting river system
- Binational*
- Specify desired ecological condition
- Narrative or numeric

GLWQA Framework



Guidance Document for Developing LEOs



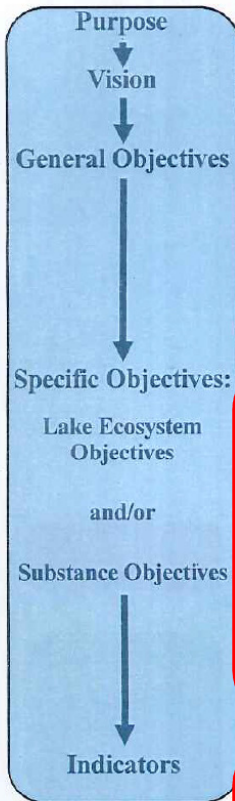
*Lake Michigan excepted

** DRAFT — for discussion at Lake Erie Partnership meeting, July 14, 2015 **

Version: July 7, 2015

Where do Lake Ecosystem Objectives Fit?

Simplified Framework



Great Lakes Water Quality Agreement — Objectives and Indicators Framework

PURPOSE: The purpose of the Great Lakes Water Quality Agreement is to restore and maintain the chemical, physical, and biological integrity of the Waters of the Great Lakes.

VISION: The Parties, recognizing the inherent natural value of the Great Lakes Basin Ecosystem, are guided by a shared vision of a healthy and prosperous Great Lakes region in which the Waters of the Great Lakes, through sound management, use and enjoyment, will benefit present and future generations of Canadians and Americans.

GENERAL OBJECTIVES: The Parties, in achieving the purpose of this Agreement, shall work to attain the following General Objectives. The Waters of the Great Lakes should:

1. Be a source of safe, high quality drinking water
2. Allow for safe swimming and other recreational use
3. Allow for human consumption of fish & wildlife free from pollutant concerns
4. Be free from pollutant impacts
5. Support habitat (including wetlands) for native species
6. Be free from nutrient impacts
7. Be free from the introduction and impact of invasive species
8. Be free from contaminated groundwater impacts
9. Be free from other impacts to water quality

LAKE ECOSYSTEM OBJECTIVES: shall be established...

					1. Minimize worst extent of hypoxic zones during summer in hypolimnion of Central LE 2. Maintain algal biomass below nuisance in nearshore Eastern LE 3. Maintain algal species at healthy levels in nearshore 4. Reduce cyanobacteria biomass in Western LE so harmful toxins are not produced 5/6. Maintain oligotrophic state, ecosystem biotic in Western/Central Lake Erie Total Phosphorus = 15 µg/l (Western Lake Erie) <i>P concentration targets available for each lake</i> Total P load = 11000 tonnes (Lake Erie) <i>P load targets available for each lake</i>			
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SUBSTANCE OBJECTIVES: are numeric targets that may be established...

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INDICATORS: The Parties shall establish and maintain comprehensive, science-based ecosystem indicators to assess the state of the Great Lakes...

<ul style="list-style-type: none"> • Treated Drinking Water 	<ul style="list-style-type: none"> • Beach Advisories 	<ul style="list-style-type: none"> • Contaminants in Edible Fish 	<ul style="list-style-type: none"> • Toxic Chemicals in GL Whole Fish • Toxic Chemicals in GL Herring Gull Eggs • Toxic Chemicals Concentrations (open water) • Atmospheric Deposition of Toxic Chemicals • Toxic Chemicals in Sediment • Water Quality in Tributaries 	<ul style="list-style-type: none"> • Coastal/Wetland Invertebrates • Coastal/Wetland Fish • Coastal/Wetland Plants • Coastal/Wetland Amphibians • Coastal/Wetland Birds • Coastal/Wetlands: Extent & Composition • Aquatic Habitat Connectivity • Phytoplankton (open water) • Zooplankton (open water) • Benthos (open water) • Diporeia (open water) • Pinyfish (open water) • Lake Trout • Walleye • Lake Sturgeon • Fish Eating and Colonial Nesting Waterbirds 	<ul style="list-style-type: none"> • Nutrients in Lakes (open water) • Harmful Algal Blooms • Cledophora 	<ul style="list-style-type: none"> • Aquatic Invasive Species • Sea Lamprey • Dreissenid Mussels • Terrestrial Invasive Species 	<ul style="list-style-type: none"> • Water Levels • Surface Water Temperature • Ice Cover • Precipitation Events • Baseflow Due to Groundwater • Watershed Stressors • Forest Cover • Land Cover • Tributary Flashiness • Hardened Shorelines • Human Population
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Legend

	LEOs (to be determined)
	GLWQA Annex 4 established objectives
	GLWQA Annex 4 interim objectives
	2016 Great Lakes Indicators

Version: June 18, 2015

LEOs: Nutrients-Annex 4

- The following nutrient-related LEOs are included in GLWQA:
 1. Minimize extent of hypoxic zones due to excessive P loading
 2. Maintain levels of algal biomass below nuisance conditions
 3. Maintain algal species consistent with healthy aquatic ecosystems in nearshore
 4. Maintain cyanobacteria biomass at levels that do not produce harmful toxins
 5. Maintain oligotrophic state, relative algal biomass and species consistent with healthy aquatic ecosystems, in the open waters of Lake Michigan
- Substance objectives (Numeric targets) and indicators (HABs)

LEO Task Team Work to Date

- Initial meeting to form tasks teams, May 2016
- Task teams to develop draft LEOs for General Objectives, 2017
 - Engage key partners in process
- Brief Management Committee on LEO progress, 2017
- Finalize LEOs

Thank you!
Questions?

