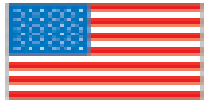
Lake Michigan LAMP and other Lakewide Initiatives

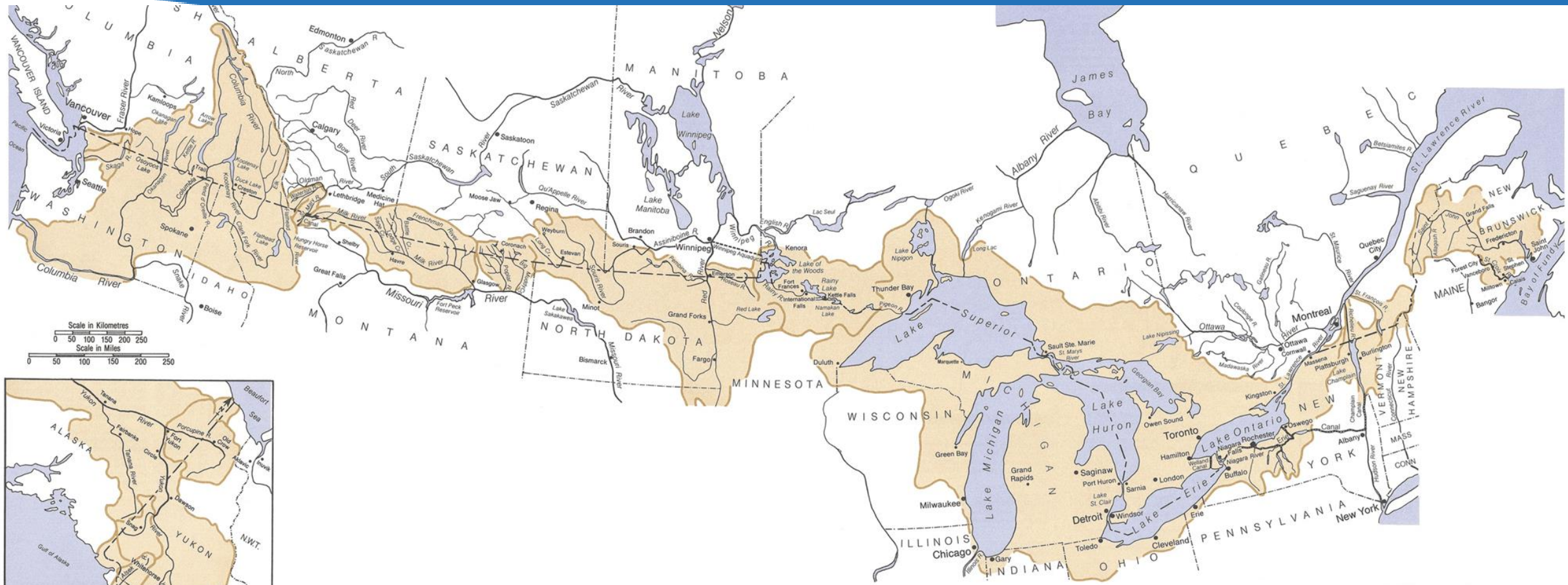
Elizabeth Hinchey Malloy – US EPA

IDEM Lake Michigan Webinar, Session #7



Canada

Shared Waters: US and Canada sign Boundary Waters Treaty in 1909

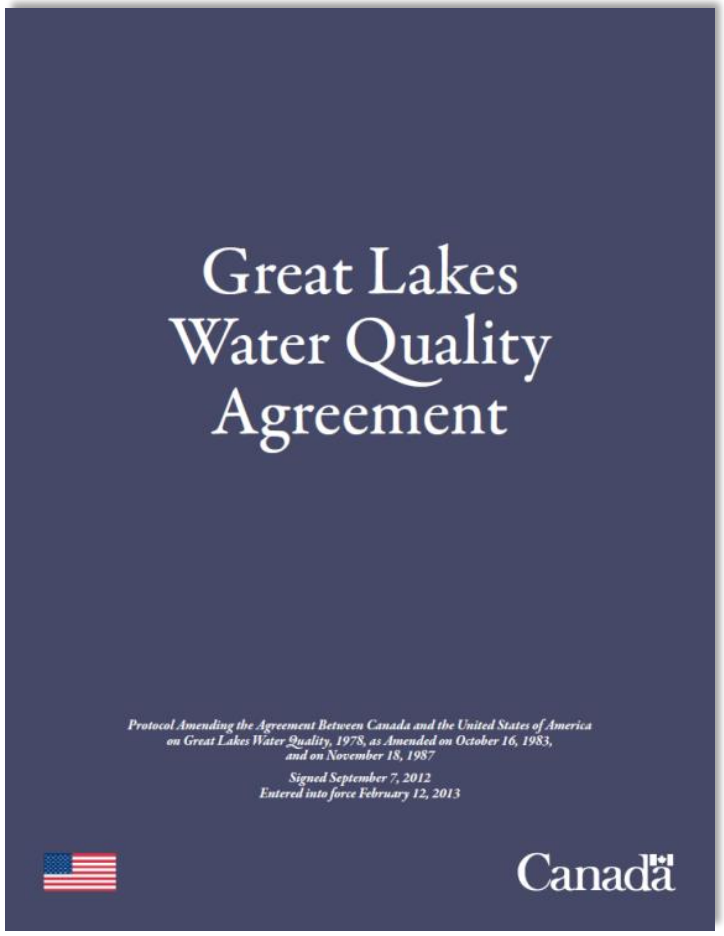


US - Canada Great Lakes Water Quality Agreement

"…to restore and maintain the chemical, physical, and biological integrity of the Waters of the Great Lakes."

1972	1978	1983	1987	2012
• Phosphorus loadings • Visible pollution	• Persistent toxic substances • Ecosystem approach to management	• Updated Phosphorus reduction strategies	• RAPs for Areas of Concern • LaMPS	• New/expanded issue annexes

2012 Great Lakes Water Quality Agreement – 10 Annexes



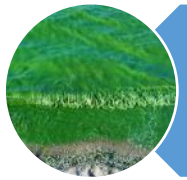
- Great Lakes Areas of Concern
- Lakewide Management
- Chemicals of Mutual Concern
- Nutrients
- Ballast Water
- Aquatic Invasive Species -New
- Habitat & Species -New
- Groundwater
- Climate Change Impacts -New
- Science

GLWQA General Objectives

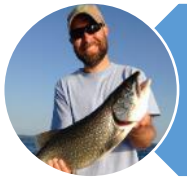
Be a source of safe, high quality drinking water

Support wetlands and other habitats for native species

Allow for safe swimming and other recreational use



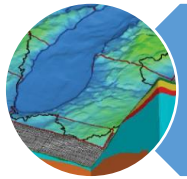
Be free from nutrient impacts



Allow for human consumption of fish & wildlife free from pollutant concerns

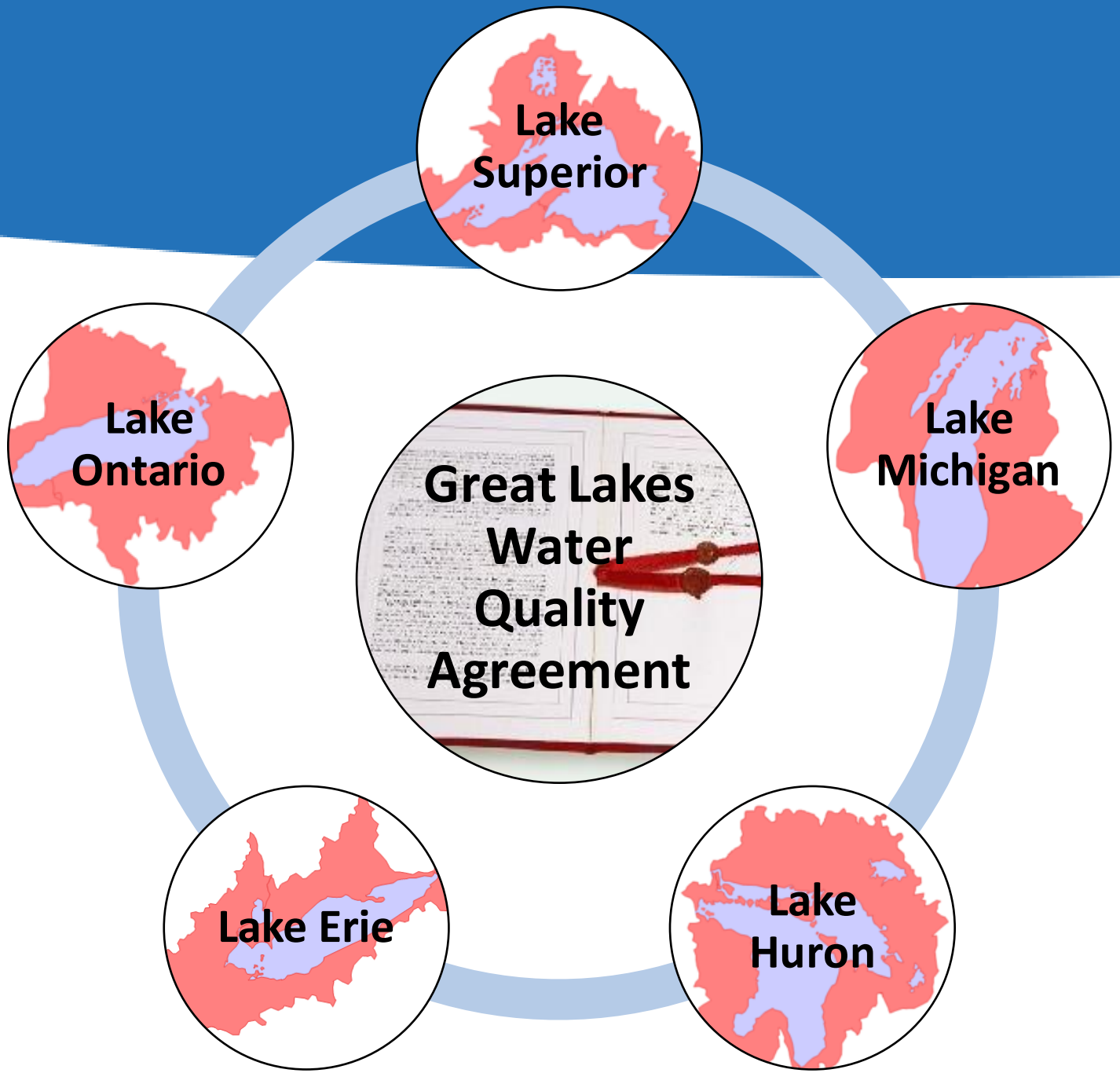
Be free from the introduction and impact of invasive species

Be free from pollutant impacts



Be free from contaminated groundwater impacts

Be free from other impacts to water quality


Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Great Lakes Water Quality Agreement

Lakewide Management

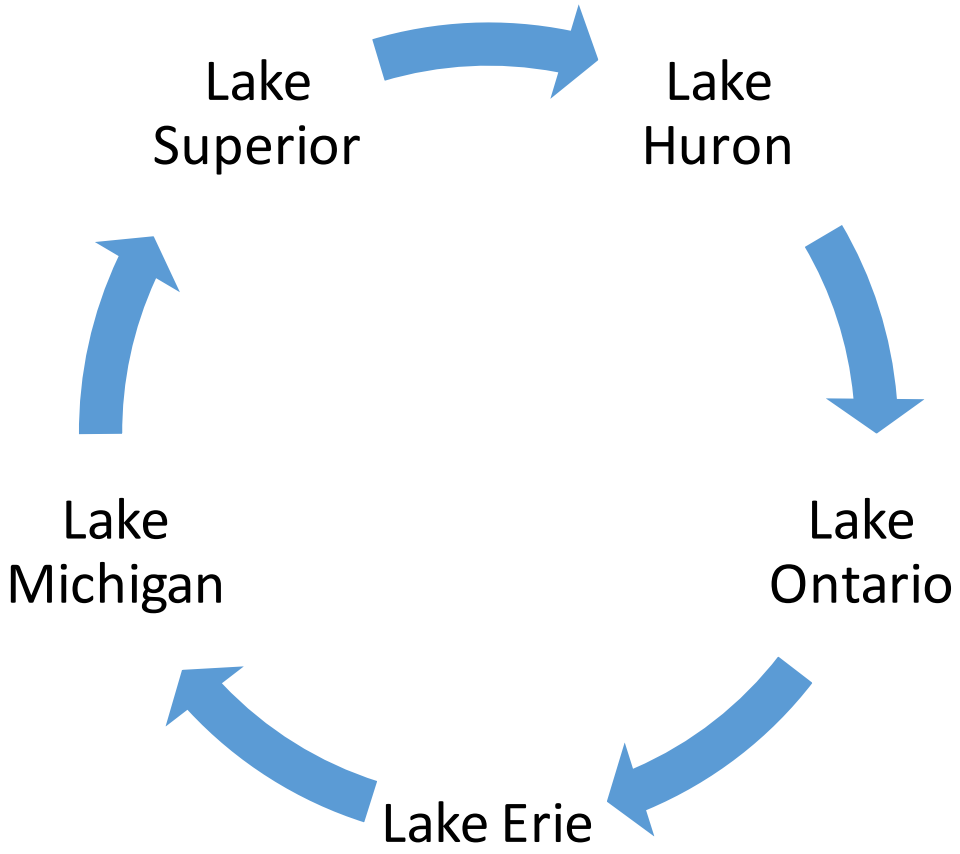
Mission:

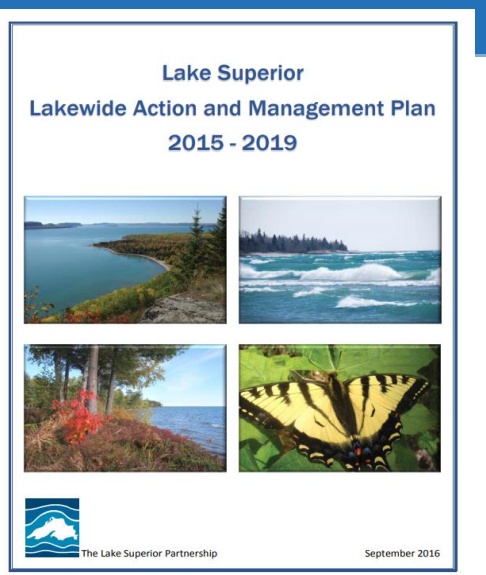
- **Review the cumulative effects of governmental programs on water quality.**
- **Identify additional actions to further restore and protect Great Lakes water quality.**
- **Identify additional research needs.**

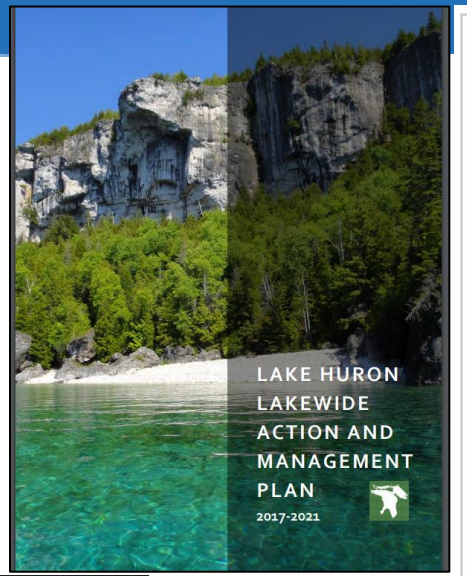
Lakewide Action and Management Plans

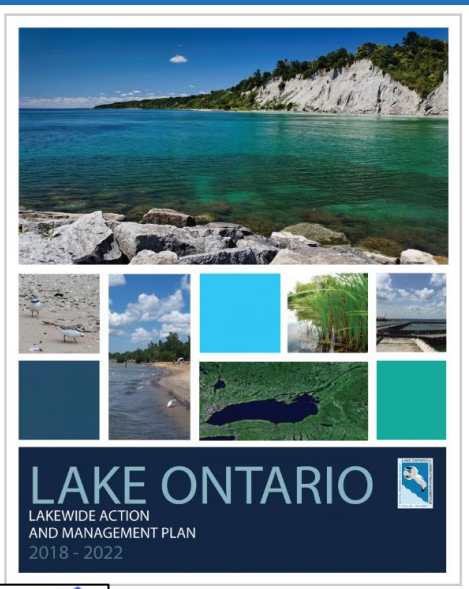
- Acronym: “LAMPs”
- A binational, ecosystem-based management strategy for protecting and restoring the water quality of a lake.
- Five-year strategic plan for:
  - Reducing chemical contamination
  - Managing nutrient levels
  - Preventing and controlling invasive species
  - Restoring native species and habitat

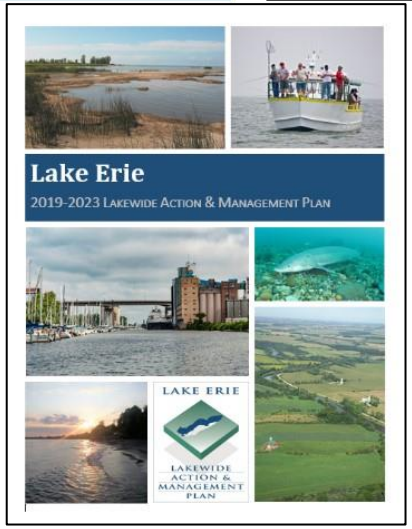
LAMPS for 5 Lakes, on a 5-year Cycle

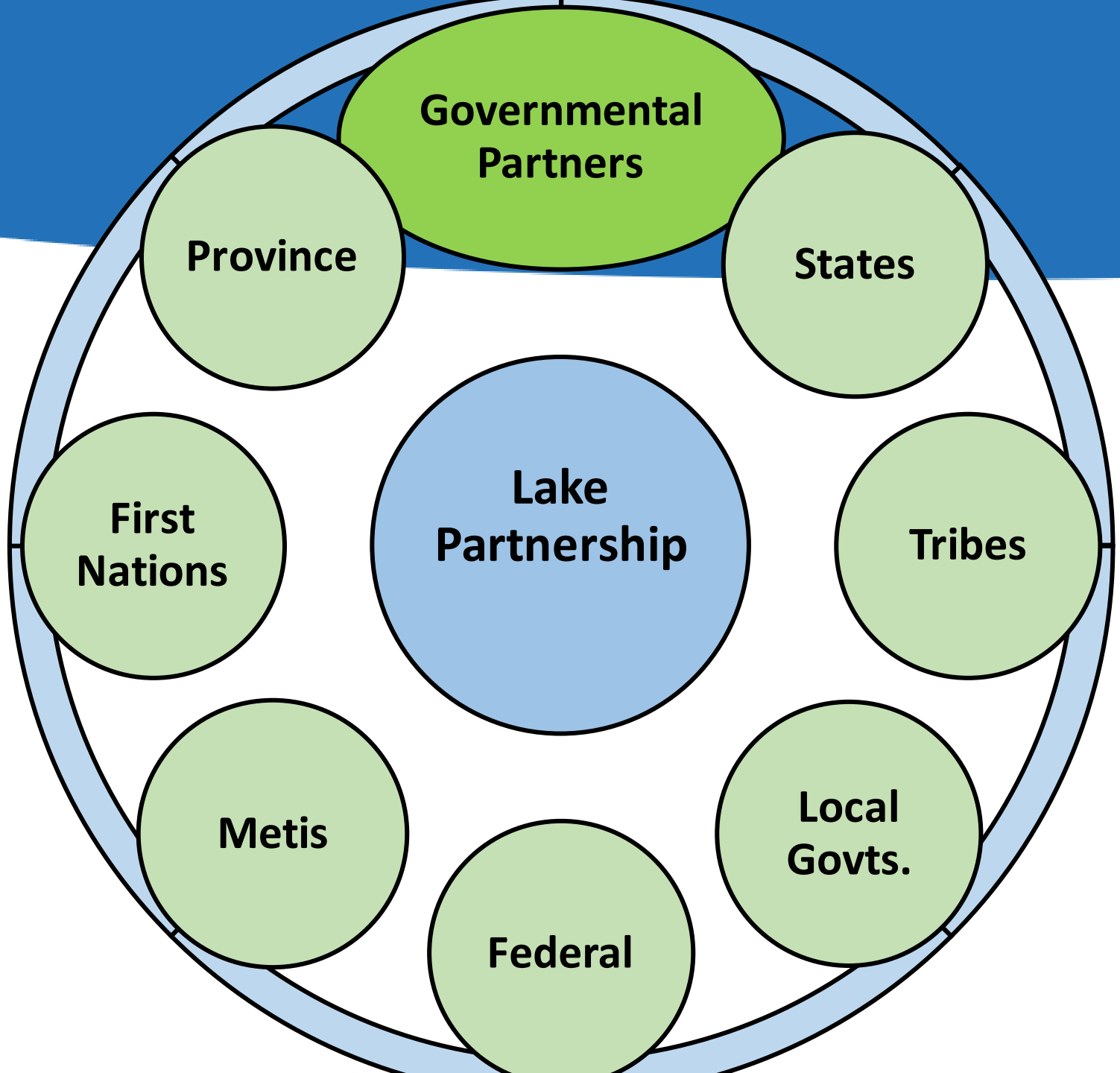











Governmental Partners
Province
States
First Nations
Lake Partnership
Tribes
Metis
Local Govts.
Federal

Lake Michigan Partnership members

- US Environmental Protection Agency
- National Oceanic and Atmospheric Administration
- US Army Corps of Engineers
- USDA Natural Resources Conservation Service
- US Geological Survey
- US Fish and Wildlife Service
- Bureau of Indian Affairs
- USDA Forest Service
- US National Park Service

21 member federal, state, municipal agencies & tribes

- Illinois Dept of Natural Resources
- Indiana Dept of Natural Resources
- Indiana Dept of Environmental Management
- Michigan EGLE
- Wisconsin Dept of Natural Resources
- City of Milwaukee Office of Environmental Collaboration
- Michigan City Sanitary District
- Chippewa-Ottawa Resource Authority
- Grand Traverse Band of Ottawa and Chippewa Indians
- Little Traverse Bay Bands of Odawa Indians
- Oneida Nation
- Little River Band of Ottawa Indiana

GLWQA Lakewide Management Annex Commitments

Reporting:

1. a LAMP for each Great Lake every five years
2. brief annual updates to the Public on each LAMP
3. report on progress toward implementation of this Annex every three years through the Progress Report of the Parties

https://binational.net

LAKE MICHIGAN LAKEWIDE ACTION AND MANAGEMENT PLAN

2018 Annual Report

In this Issue

Overview 1
Accomplishments 1
Addressing Challenges 2
Contact Information 4

What is the Lake Michigan LAMP?

Under the Great Lakes Water Quality Agreement (GLWQA), the governments of Canada and the United States have committed to restore and maintain the physical, biological, and chemical integrity of the waters of the Great Lakes.

The Lake Michigan Lakewide Action and Management Plan (LAMP) is an ecosystem-based management strategy for protecting and restoring Lake Michigan's water quality. The LAMP is coordinated by the Lake Michigan Partnership, which is led by the U.S. Environmental Protection Agency (U.S. EPA) with participation from federal, state, tribal and local governments or agencies, and with input from non-governmental stakeholders and the public. The next LAMP will be issued in 2020 and in the coming years, the Lake Michigan Partnership will be working to assess the state of the lake, measure progress towards LAMP goals and objectives, and promote management actions to address identified problems.

This 2018 Annual Report highlights accomplishments and progress in achieving LAMP goals and objectives.

Overview

The Lake Michigan basin is home to the world's fifth largest lake and contains the world's largest collection of freshwater sand dunes. It also hosts many wetlands, prairies, forests, and savannas that provide essential habitat to a diverse array of plant and animal species. The Lake Michigan coastline has 25 harbors, hundreds of marinas, and serves as a key North American migratory bird flyway.

The Lake Michigan Partnership's 2018 Annual Report provides information and updates on habitat and species restoration; fishery management; and shoreline management research.

Accomplishments

Lake Sturgeon Recovery Efforts

The Lake Sturgeon was an important member of the Lake Michigan native benthic fish community, but suffered drastic population declines by the early 1900s. Barriers to essential river spawning habitat (e.g., tributary dams), landscape changes, and overfishing are thought to have contributed to the sturgeon's decline. Current restoration efforts for this long-lived migratory species involve protecting known populations, improving habitat, providing fish passage, and stocking fish, all guided by continued research and evaluation. Projects typically involve coordinated efforts among state, tribal and federal agencies, with assistance from local governments, non-governmental organizations and volunteer groups.

Juvenile Lake Sturgeon. Photo: R. Elliott, U.S. Fish and Wildlife Service.

2020-2024 Lake Michigan LAMP

- LAMP will identify *Management Actions* to address threats and impacts to Lake Michigan:
  - Prevent and Reduce Nutrient and Bacterial Pollution
  - Reduce and Reduce Chemical Contamination
  - Protect and Restore Habitat and Native Species
  - Prevent and Contain Invasive Species
  - Promote Resilience to Climate Impacts
- Draft LAMP will be available for public comment later this year

LAKE MICHIGAN
Lakewide Action and Management Plan
ASSESS • PROTECT • RESTORE • REPORT

Cooperative Science and Monitoring Initiative

- CSMI is a binational effort to provide lake managers and fishery managers with the science and monitoring information to assist with management decisions on each Great Lake.

- Lake Partnerships identify priorities

- Science Annex leads planning/coordination of science and monitoring to address the priorities

- 2015 CSMI report https://iiseagrant.org/

Cooperative Science and Monitoring Initiative

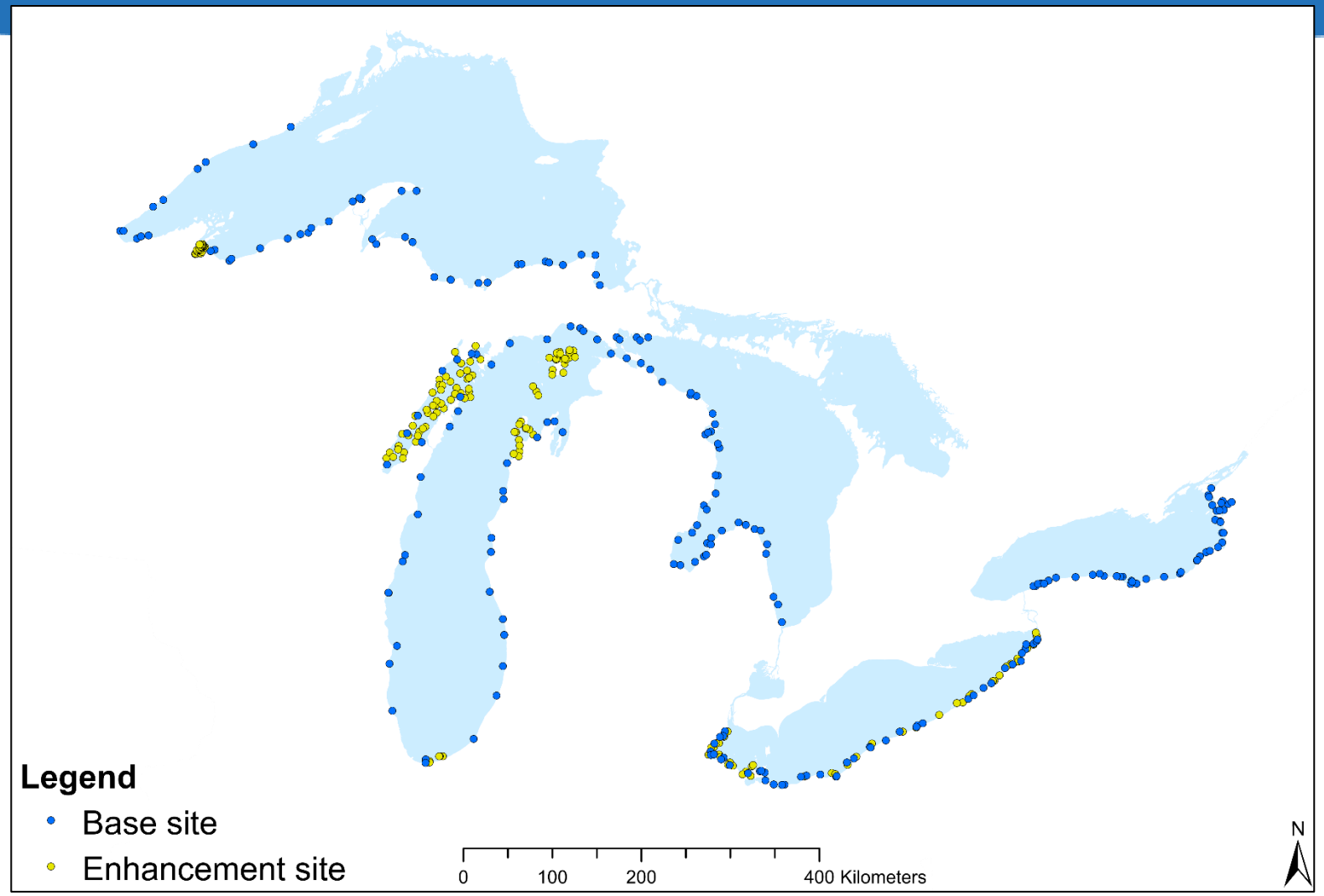
- Five-Year Cycle:
  - **Field Year** – science activities, sample collection
  - **Data Analysis** – analysis of collected samples
  - **Report out** – scientific findings, results
  - **Priority Setting** – Lake Partnership identifies needs for next Field Year
  - **Planning** – Agencies and partners develop sampling plans

Lake Michigan 2020 CSMI Priorities

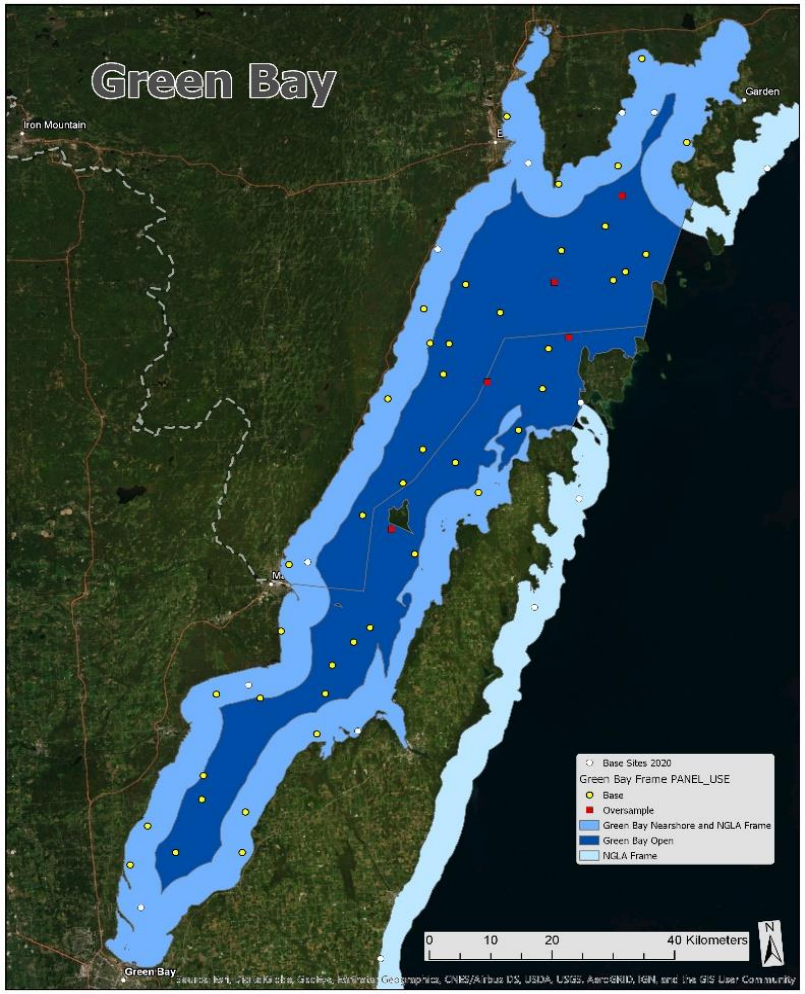
- lower food web changes/declining open water nutrients impacts on prey fish (e.g., alewife), lake whitefish and salmon
- groundwater contributions to nutrient & chemical loads
- distributions of emerging contaminants in Lake Michigan waters/sediments
- Impacts of land use changes on cycling of nutrients, carbon, and mercury and impacts to habitats for rare species/critical life stages
- identification of values of diverse Lake Michigan stakeholder groups to better understand how people use and value the lake and its resources

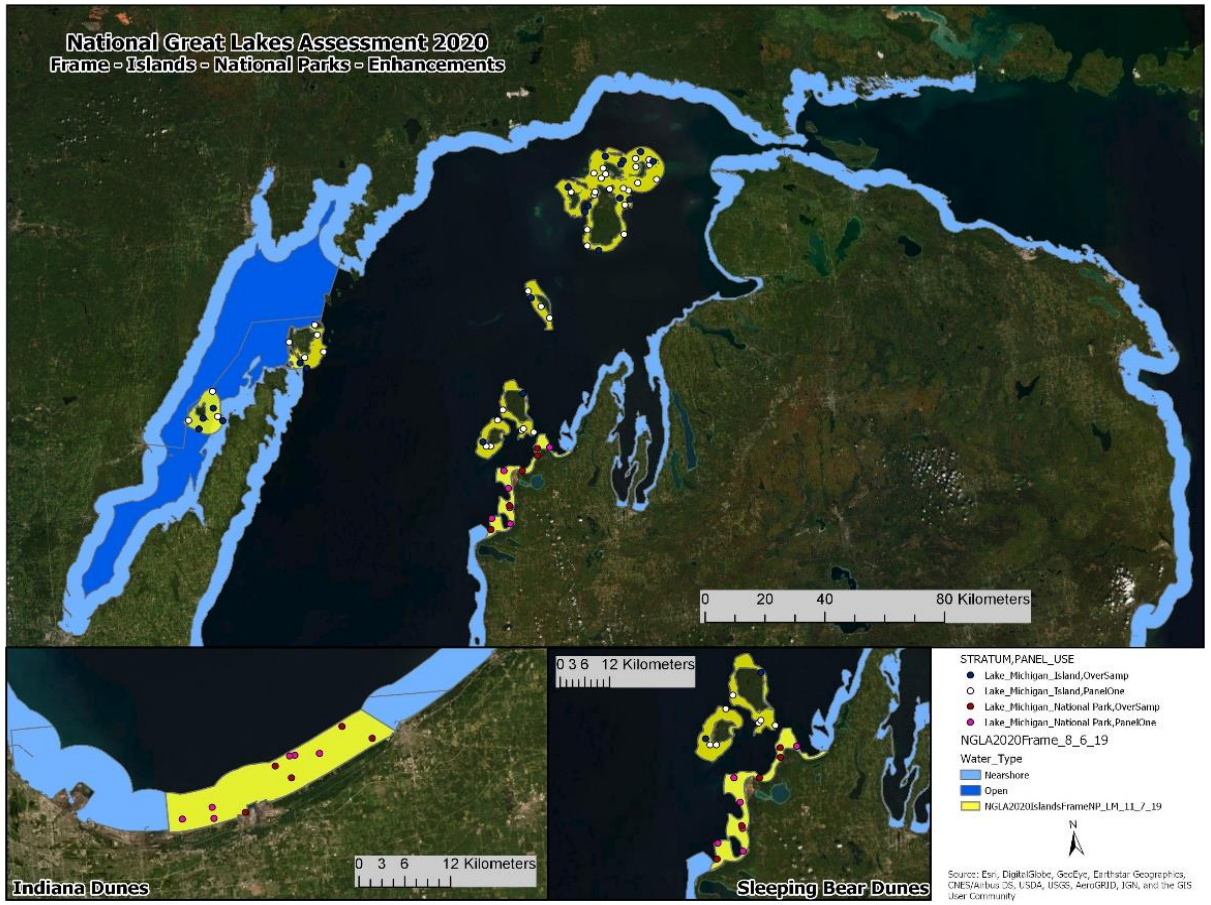
EPA's National Coastal Condition Assessment

- National and regional condition estimates
- Standardized sampling, probability-based design
- Great Lakes added 2010, repeated 2015, 2020/21
- Indices: benthos, water quality, sediment, fish tissue contaminants
- Broad-scale snapshot of percent of nearshore area in good, fair, poor condition

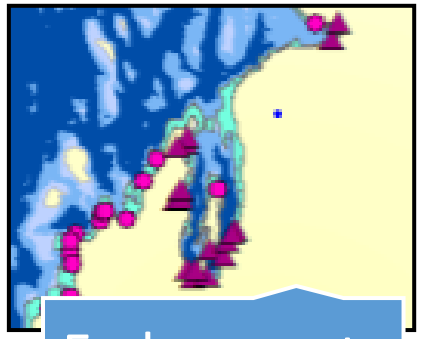


NCCA 2020 Lake Michigan enhancements

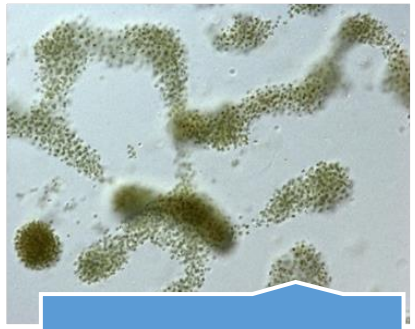




NCCA Great Lakes Enhancements



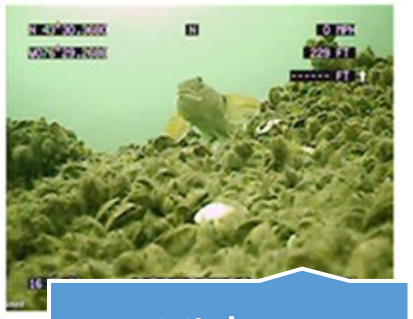
Embayments



HABs toxins

Connecting Rivers

Fish tissue



Video

NPS/states

Lake Erie basins

NCCA Reporting

- National Reports https://www.epa.gov/national-aquatic-resource-surveys/ncca
- Great Lakes Technical Reports for States, journal publications, LAMPs
- NCCA Dashboard https://coastalcondition.epa.gov/#
- Use Great Lakes indicators and agency monitoring to put NCCA assessment results in context for use in the LAMPs

U.S. EPA Coastal Condition Assessment 2010

Percentage of Coastal Area in Good Condition (1999-2010)

2010 Estimates, Change and Long-Term Change | Lake Michigan

Indicators of Coastal Condition		% of Coasts in Good Condition (0% 20% 40% 60% 80% 100%)	Change†	Long-Term Change (% Points)† (-40% -20% 0% 20% 40% 60% 80%)
Biological	Benthic Index		N/A	N/A
Water	Water Quality Index		N/A	N/A
	Phosphorus		N/A	N/A
	Nitrogen	No Observed Coastal Area	N/A	N/A
	Dissolved Oxygen		N/A	N/A
	Water Clarity		N/A	N/A
	Chlorophyll a		N/A	N/A
Sediment	Sediment Quality Index		N/A	N/A
	Sediment Contaminants		N/A	N/A
	Sediment Toxicity		N/A	N/A
Eco-Fish	Fish Quality Index		N/A	N/A

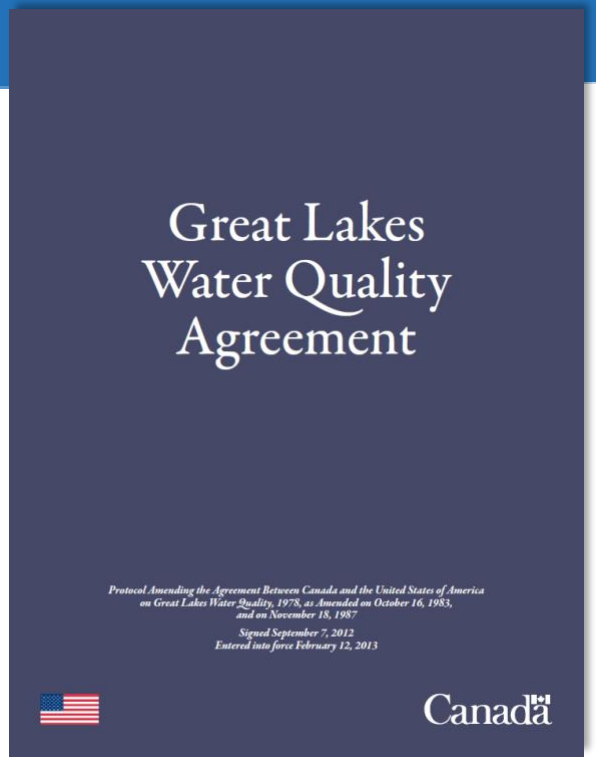
† Survey designs varied among periods; only comparable data are summarized in change and long-term change graphs. See: https://go.usa.gov/x5Nd5.

* Statistically significant difference (95% confidence) between 1999-2001 and 2010. Also represented by a darker-colored long-term change symbol.

U.S. Environmental Protection Agency. OW and ORD (2015). *National Coastal Condition Assessment 2010 (EPA 841-R-15-006)*. Washington, DC. December 2015.

2012 Great Lakes Water Quality Agreement – Lake Michigan LAMP

- Renewed commitment to lakewide management (Lakewide Action and Management Plans)
- LAMPs are to be blueprints for action that identify and prioritize desired restoration and protection activities to improve/protect Great Lakes water quality and meet “General Objectives”



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