

US EPA ARCHIVE DOCUMENT

A scenic view of Niagara Falls, showing the water cascading over the rocky cliffs, with a large plume of white mist rising from the base of the falls. The surrounding area is lush with green trees and vegetation. The sky is overcast with grey clouds. The text "Coastal Zones and Aquatic Habitats" is overlaid in a yellow font with a black outline on a dark rectangular background.

# Coastal Zones and Aquatic Habitats

Gail Hesse  
Ohio Environmental Protection Agency



# Coastal Zones



# Coastal Zones

POOR

MIXED

FAIR

GOOD

Effect of Water Level  
Fluctuations

?

Extent of Hardened  
Shoreline



Biodiversity Conservation  
Sites

*No Assessment*

**Area. Quality, & Protection  
of Special Communities:**

- Cobble Beaches



2005 Report

- Alvars

?

2001 Report

- Sand Dunes

*No Assessment*

- Islands

?

# Coastal Zones

POOR

MIXED

FAIR

GOOD

Coastal Wetland  
Invertebrate Communities

*No Assessment*

Coastal Wetland Fish  
Communities

*No Assessment*

Coastal Wetland Amphibian  
Communities



Contaminants in Snapping  
Turtle Eggs

?

2007 Report

Coastal Wetland Bird  
Communities



Landscape Extent and  
Composition



Coastal Wetland Plant  
Communities

?

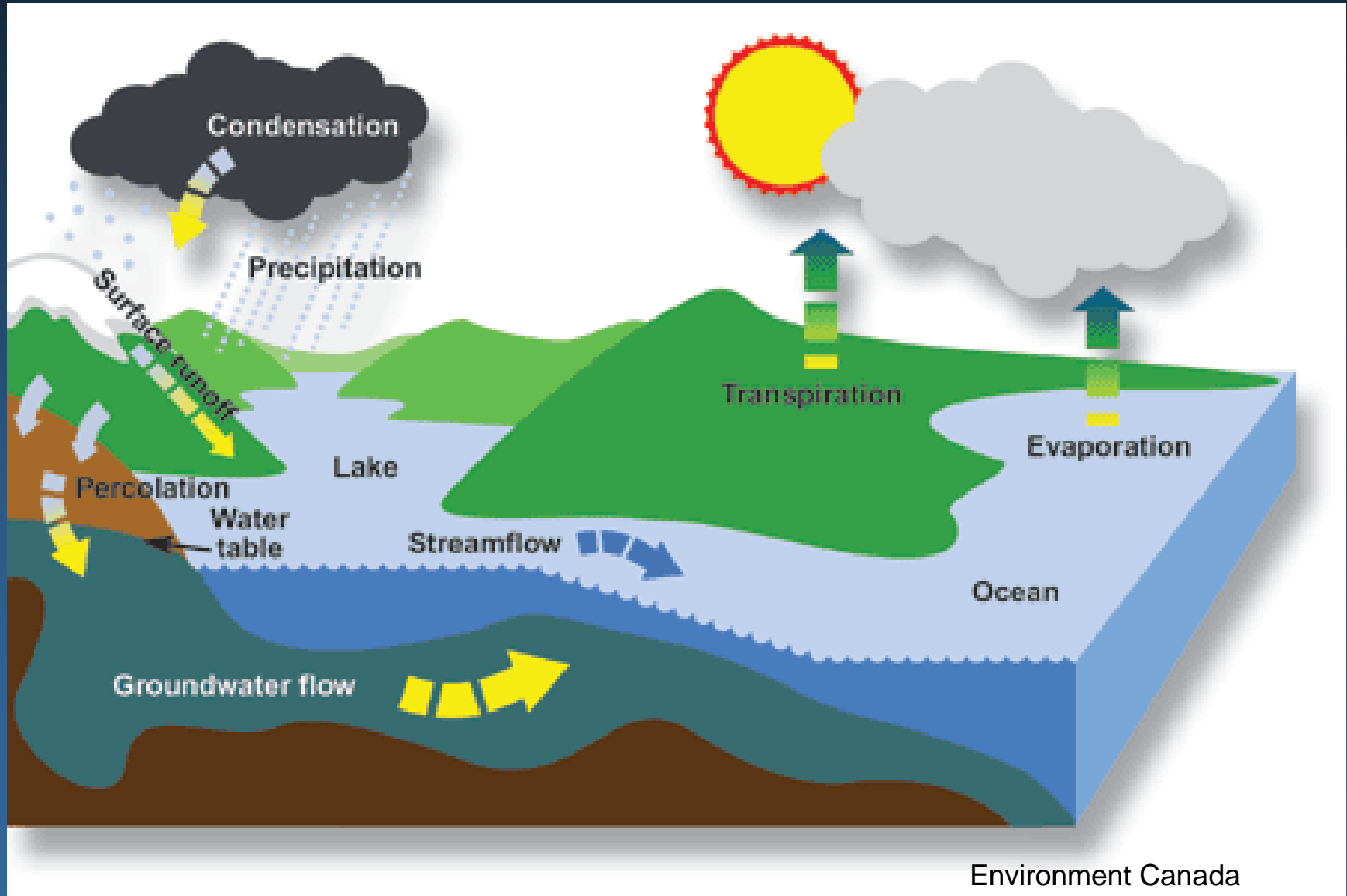
Land Use Adjacent to  
Wetlands

*No Assessment*



# Water Level Fluctuations

## Natural Factors



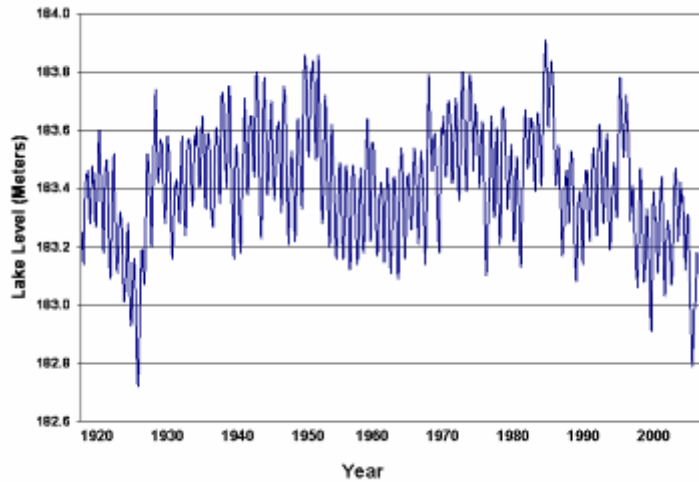
# Water Level Fluctuations

## Anthropogenic Factors

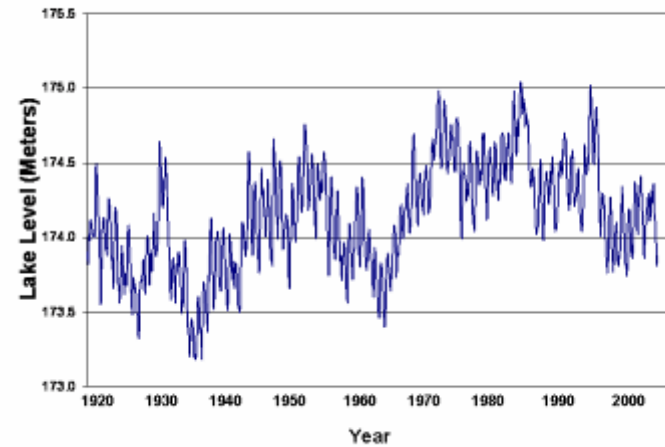


# Water Level Fluctuations

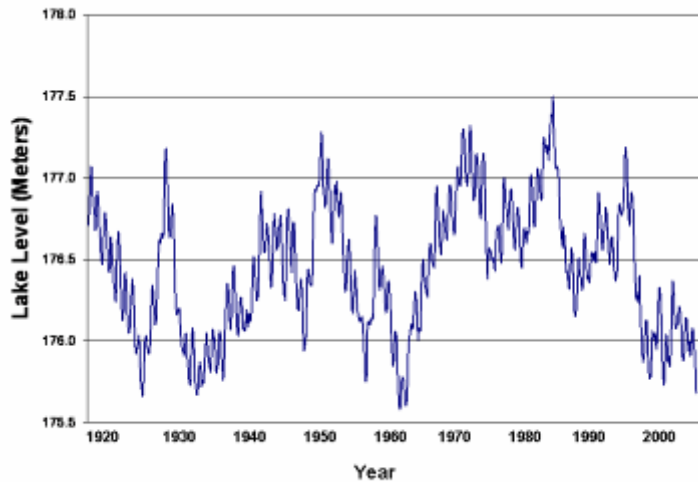
Lake Superior



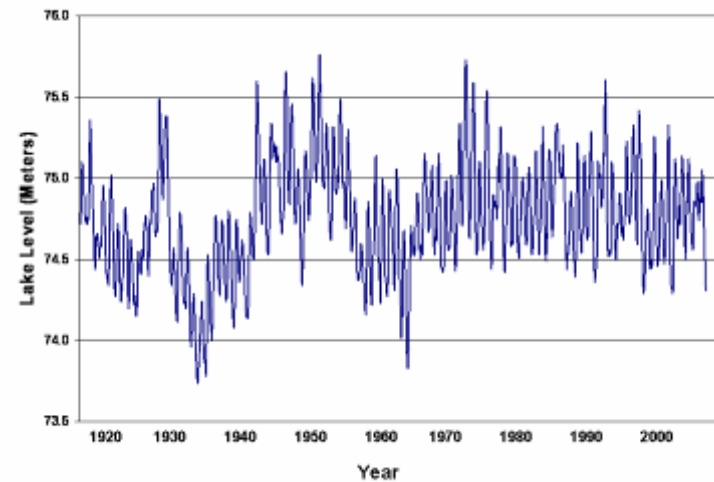
Lake Erie



Lakes Michigan-Huron

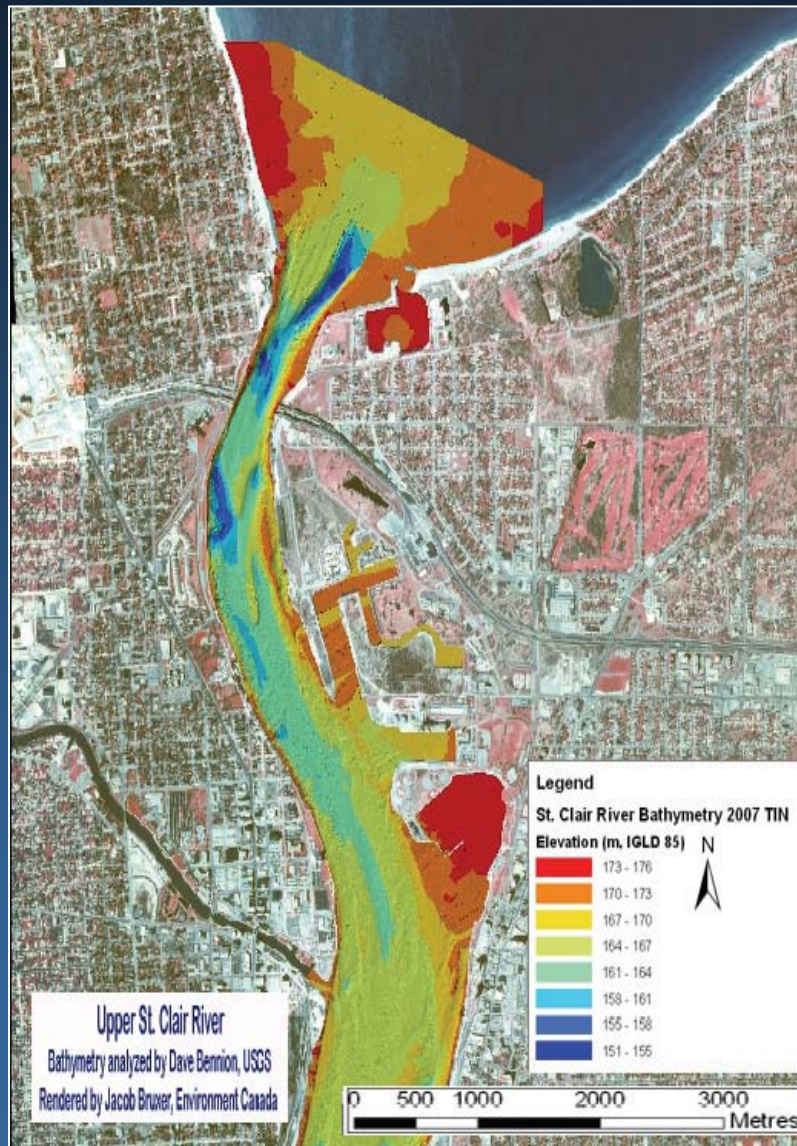


Lake Ontario





# International Upper Great Lakes Study



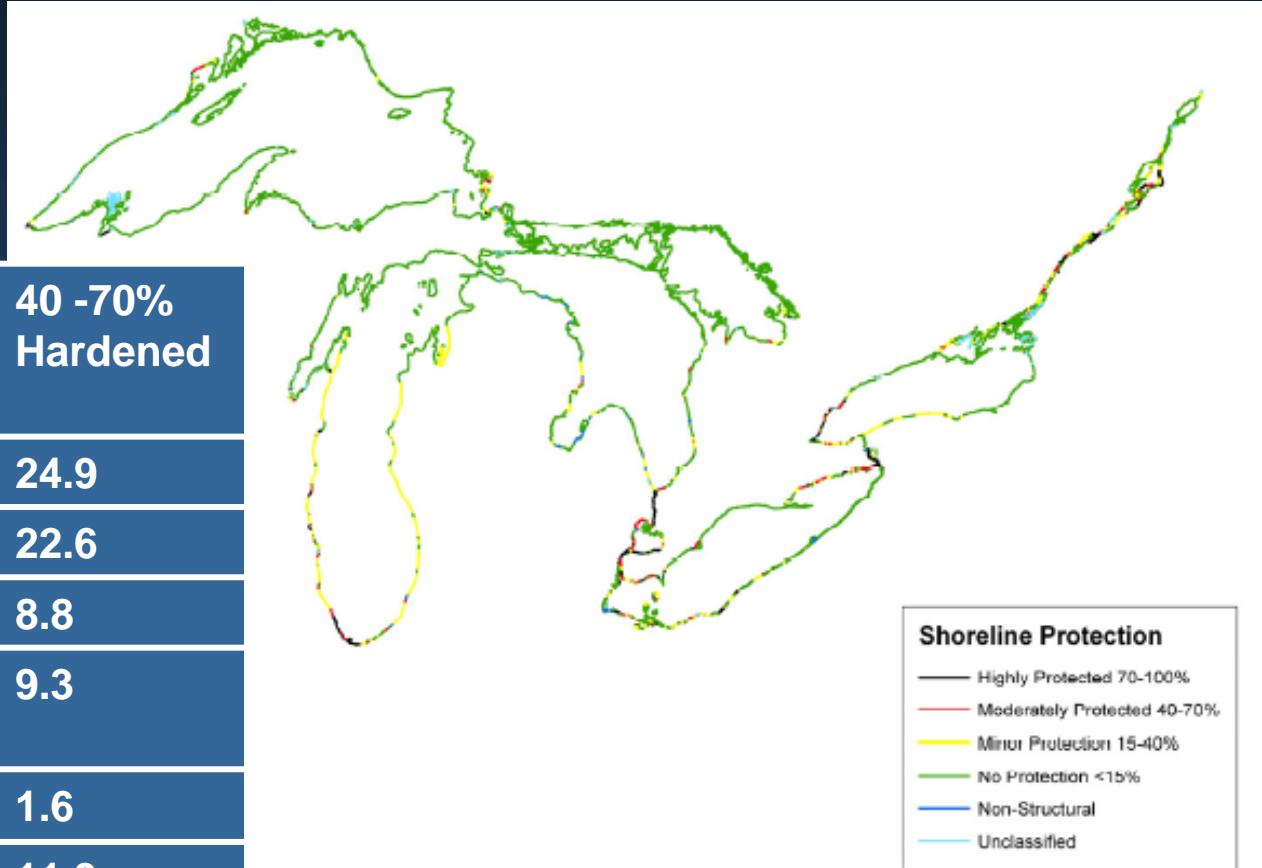
- What is causing the declining head difference between Lakes Michigan/Huron-Erie?
- Has the St. Clair River flow regime changed with time and if so, why?
- Have the velocity patterns in the St. Clair River been modified and if so, what are the implications?
- Is the St. Clair River bed stable or eroding?
- If the bed of the St. Clair is eroding, what initiated it and when?
- Has the sediment budget for the St. Clair River changed and if so, what are the implications?

# Order and Plan 2007



IJC has proposed a one-year process to resolve outstanding issues and obtain concurrence of the two Federal governments

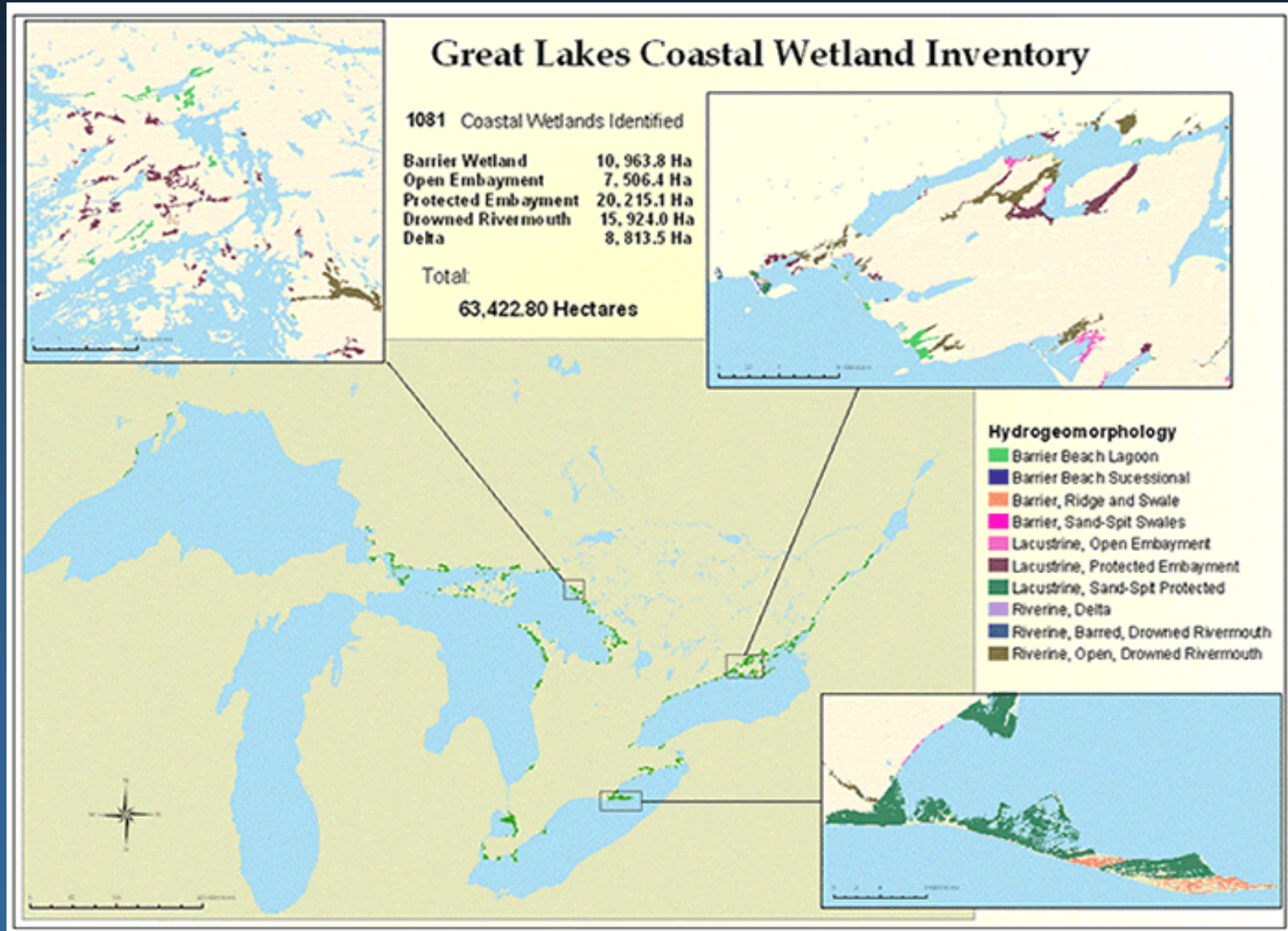
# Hardened Shoreline



Lake/ Connecting Channel	70 -100% Hardened	40 -70% Hardened
St. Clair River	69.3	24.9
Detroit River	47.2	22.6
Niagara River	44.3	8.8
St. Lawrence Seaway	12.6	9.3
St. Marys River	2.9	1.6
Lake Erie	20.4	11.3
Lake St. Clair	11.3	25.8
Lake Ontario	10.2	6.3
Lake Michigan	8.6	2.9
Lake Superior	3.1	1.1
Lake Huron	1.5	1.0



# 217,000 Hectares of Great Lakes Coastal Wetlands





# Coastal Zones

POOR

MIXED

FAIR

GOOD

Coastal Wetland  
Invertebrate Communities

*No Assessment*

Coastal Wetland Fish  
Communities

*No Assessment*

Coastal Wetland Amphibian  
Communities



Contaminants in Snapping  
Turtle Eggs

?

2007 Report

Coastal Wetland Bird  
Communities



Landscape Extent and  
Composition



Coastal Wetland Plant  
Communities

?

Land Use Adjacent to  
Wetlands

*No Assessment*



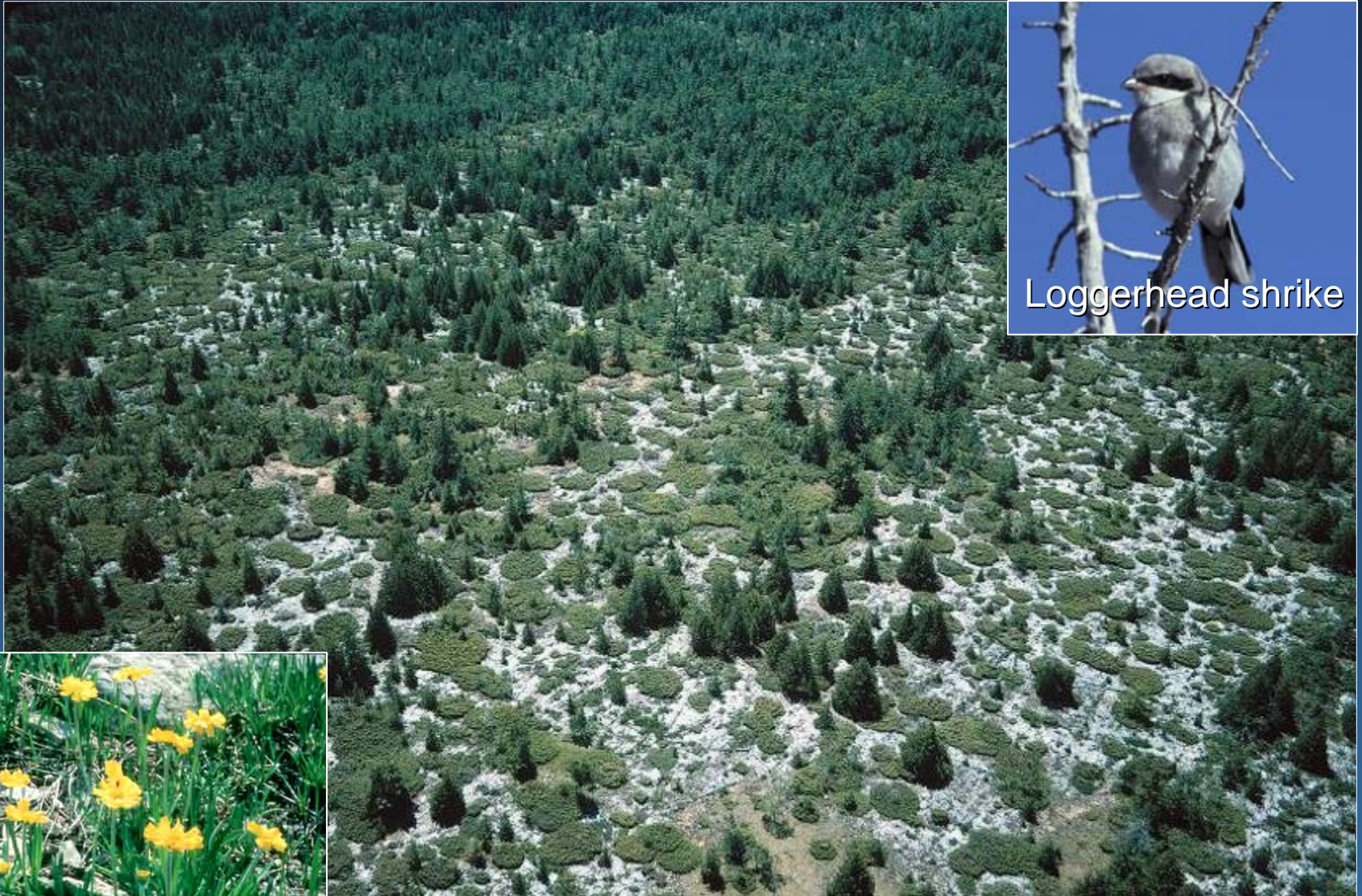
**Georgian Bay Islands, Lake Huron**

# LAKE SUPERIOR ISLANDS





# Alvars



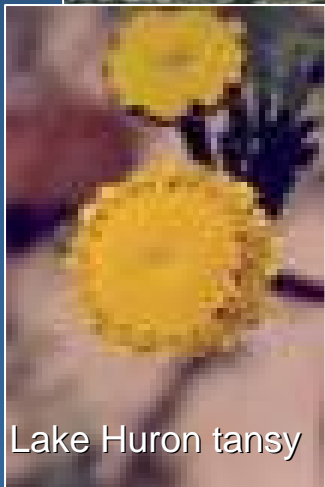
Loggerhead shrike



Lakeside daisy



# Cobble Beaches



Lake Huron tansy



Houghton's goldenrod

# Sand Dunes



Piping plover



Pitcher's thistle





# Aquatic Habitats



Photo Credit: USDA Natural Resources Conservation Service, Romy Myska

# Aquatic Habitats

POOR

MIXED

FAIR

GOOD

## Open Lake

P Conc'ns & Loadings  
Nearshore

?

Open Lake



Toxic Chemical Conc'ns in  
Offshore Waters

?

Conc'ns of Contaminants in  
Sediments Cores



Extent of Hardened  
Shoreline



## Groundwater

Natural GW Quality and  
Human-Induced Changes

No Assessment

GW & Land: Use & Intensity

No Assessment

Base Flow Due to GW  
Discharge



GW Dependant Plant &  
Animal Communities

No Assessment



# Phosphorus Concentrations and Loadings



# Ohio Lake Erie P Task Force *draft* Summary Conclusions



- Soluble Reactive Phosphorus (SRP) is a primary cause of algal blooms
- SRP is stratifying in the top 2" of the soil profile
- SRP loadings are driven by runoff events
- *Dreissinids* are a factor

# Ohio Lake Erie P Task Force *draft* Recommendations

- Manage P inputs
  - Land application of fertilizer
  - Land application of manure
- Amount, timing and incorporation are critical factors
- Management options include:
  - Increase use of soil tests
  - Update screening tools that account for agronomic need and environmental risk
  - Align with application recommendations

# Aquatic Habitats

POOR

MIXED

FAIR

GOOD

## Open Lake

P Conc'ns & Loadings  
Nearshore

?

Open Lake



Toxic Chemical Conc'ns in  
Offshore Waters

?

Conc'ns of Contaminants in  
Sediments Cores



Extent of Hardened  
Shoreline



## Groundwater

Natural GW Quality and  
Human-Induced Changes

No Assessment

GW & Land: Use & Intensity

No Assessment

Base Flow Due to GW  
Discharge



GW Dependant Plant &  
Animal Communities

No Assessment



# Grand River Watershed



# Coastal Zones Management Challenges

- Water levels—learn the lessons and apply basinwide
- Protect and restore wetlands and associated uplands, islands, alvars, cobble beaches, sand dunes
- Support and implement new wetland monitoring protocols
- Develop remote sensing technologies
- Project by project and landscape level

# **Aquatic Habitats Management Challenges**

- Develop indicators for all aquatic habitats
- Establish the connection of soluble P and nuisance algal blooms
- Collaborate and coordinate across jurisdictions



