


US EPA ARCHIVE DOCUMENT

A wide-angle photograph of Niagara Falls, showing the massive volume of water cascading over the rocky ledge. The surrounding landscape is lush with green trees and vegetation. The sky is overcast with grey clouds. The water at the base of the falls is a deep blue-green color, with white foam from the falling water visible. The foreground shows a rocky outcrop with green plants.

Nearshore Terrestrial Ecosystems

Dan Kraus
The Nature Conservancy Canada



Photo Credit: GLNPO Image Collection (Minnesota Extension Service, Dave Hansen)

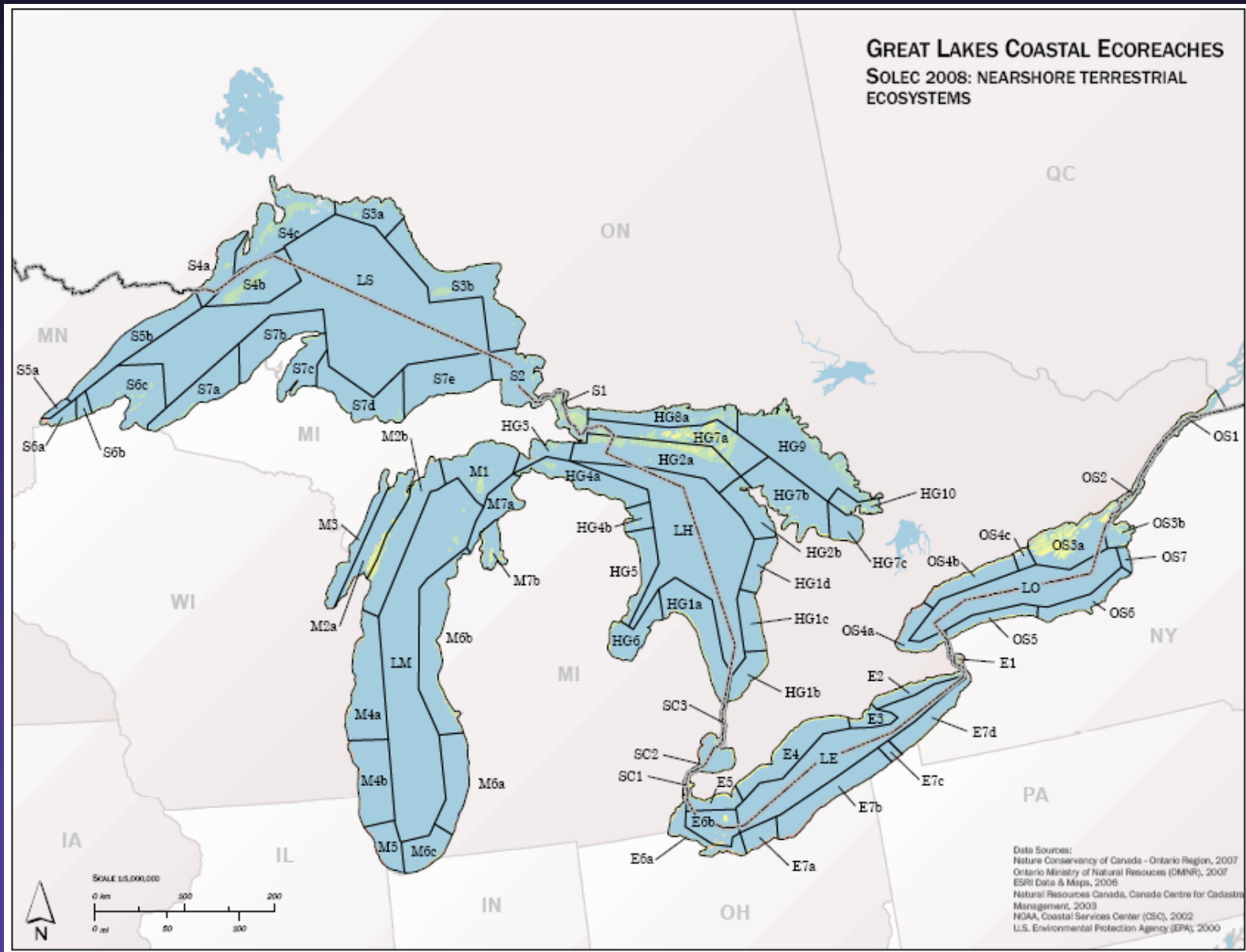
Project Goals

- Update from 1996 SOLEC report on Nearshore Terrestrial Ecosystems (Reid & Holland 1997)
- Establish baseline information
- Identify trends

Methods

- Data-driven approach
- GIS analysis of coastal ecosystems to assess extent & distribution
- GIS assessment of condition/ pressures based on landcover
- Literature review to examine classification of coastal ecosystems, their condition & pressures

Methods



Importance of Coastal Terrestrial Ecosystems

- 28,300 km of coast
- Over 25 globally rare vegetation communities
- Endemic species



Importance of Coastal Terrestrial Ecosystems

- Linked to the biodiversity and health of nearshore waters
- Zone of transfer of biomass and sediments



Chimney Bluffs State Park
Photo: New York State Parks



Mayflies
Lake Erie

Coastal Terrestrial Ecosystems



Cobble Beach
Manitoulin Island, Lake Huron

1. Great Lakes Sand Beaches
2. Great Lakes Foredunes
3. Coastal Back Dune Complexes
4. Bedrock Shores
5. Cobble Beaches
6. Shoreline Cliffs
7. Shoreline Bluffs
8. Lakeplain Prairies
9. Arctic-Alpine Disjunct Communities
10. Atlantic Coastal Plain Disjunct Communities
11. Rich Coastal Fens
12. Shoreline Alvars
13. Coastal Rock Barrens
14. Great Lakes Coastal Forests

Great Lakes Sand Beaches

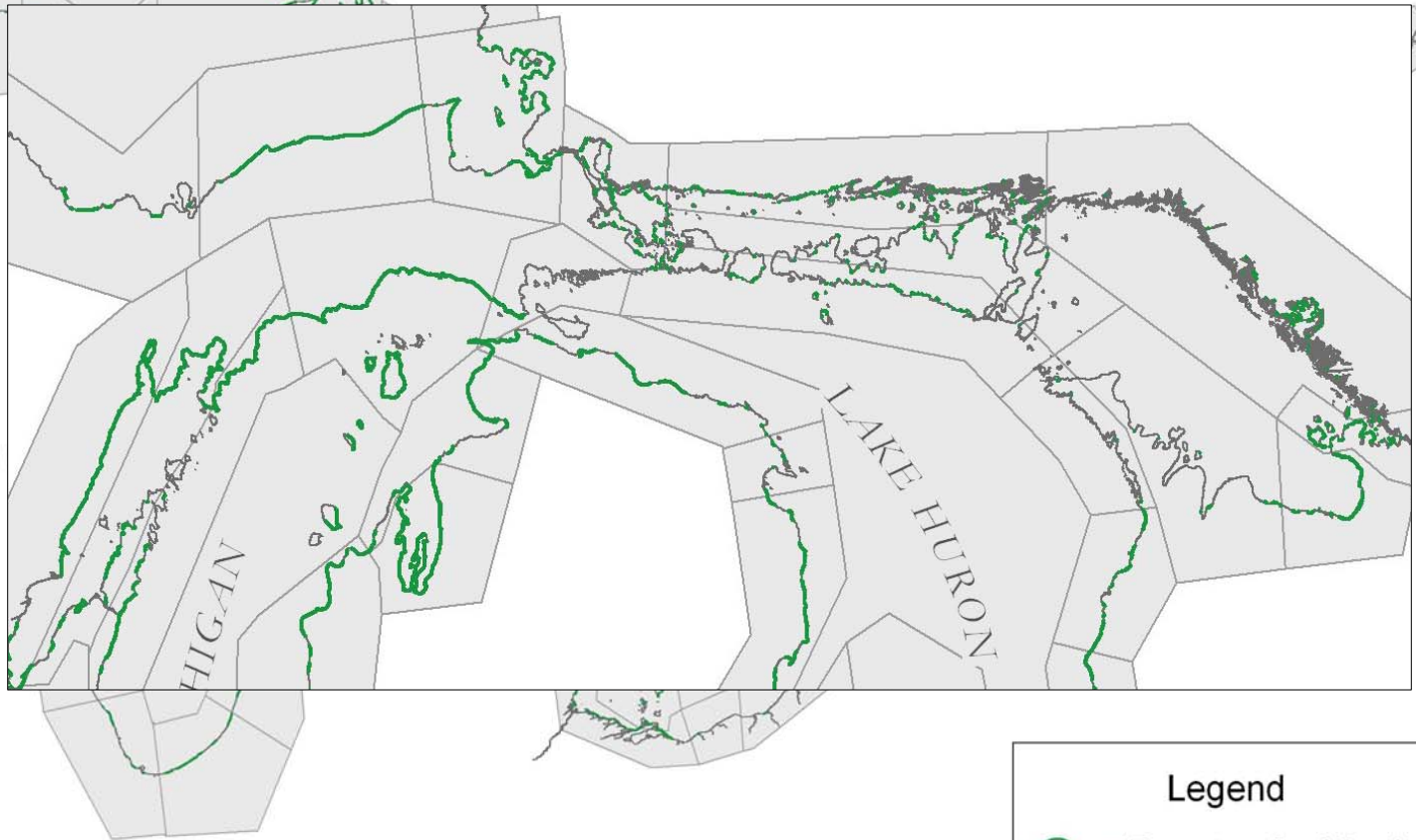
- 3385 km
- Ranked globally rare
- Many key sites are within protected areas



Great Lakes Beach
Carter Bay, Lake Huron




Great Lakes Sand Beaches

	% of Coast - Status/Trend
Superior	9.5% - good/ unchanging
Michigan	61.1% - mixed/ unchanging
Huron	6.2% - mixed/ unchanging
St. Clair	1.2% - poor/ undetermined
Erie	14.4% - mixed/ unchanging
Ontario	13.5% - mixed/ unchanging



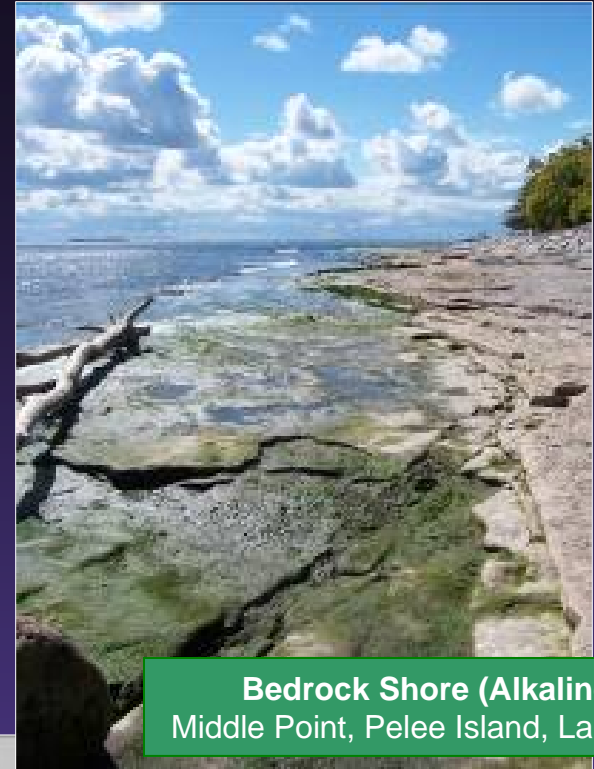
Scale 1:5,200,000

Legend

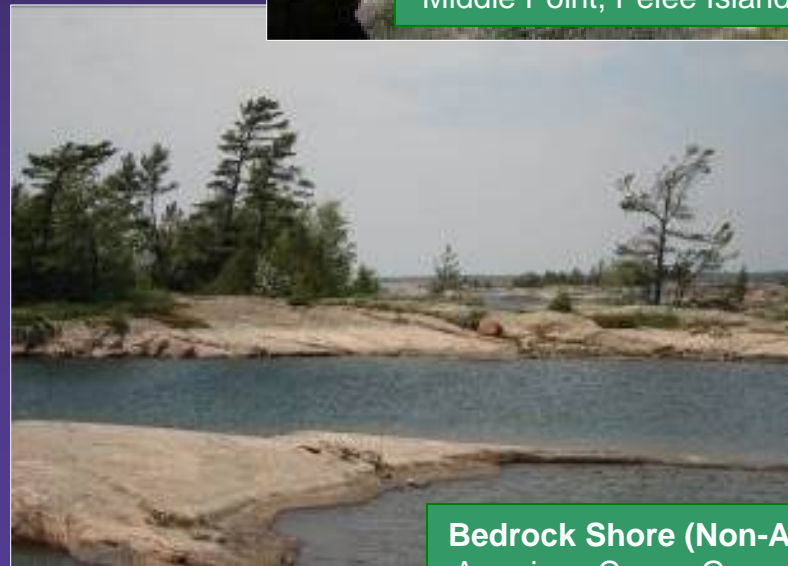
-  Ecosystem: Sand Beach
-  Great Lakes Shoreline
-  Coastal Reach

Bedrock Shores

- 6000 km
- Four major types identified based on substrate
- Limestone and sandstone types considered globally rare



Bedrock Shore (Alkaline)
Middle Point, Pelee Island, Lake Erie



Bedrock Shore (Non-Alkaline)
American Camp, Georgian Bay

Bedrock Shore


	% of Coast - Status/Trend
Superior	28.7% - good/ improving
Michigan	10.9% - mixed/ deteriorating
Huron	26.0% - good/ improving
St. Clair	1.8% - poor/ unchanging
Erie	8.2% - mixed/ deteriorating
Ontario	16.5% - mixed/ deteriorating



Scale 1:5,200,000



Legend

-  Ecosystem: Bedrock Shore
-  Great Lakes Shoreline
-  Coastal Reach

Cobble Beaches

- 2720 km
- Three major types identified based on substrate
- Limestone type considered globally rare



Cobble Beach
Gravelly Point, Bruce
Peninsula, Georgian Bay



Cobble Beach
Cape Hurd, Bruce Peninsula,
Lake Huron

Cobble Beach



Scale 1:5,200,000

	% of Coast - Status/Trend
Superior	14.1% - good/ improving
Michigan	0.5% - mixed/ deteriorating
Huron	12.7% - good/ improving
St. Clair	0.2% - poor/ unchanging
Erie	1.8% - mixed/ unchanging
Ontario	7.5% - mixed/ deteriorating



Legend

-  Ecosystem: Cobble Beach
-  Great Lakes Shoreline
-  Coastal Reach

Atlantic Coastal Plain Disjunct Communities



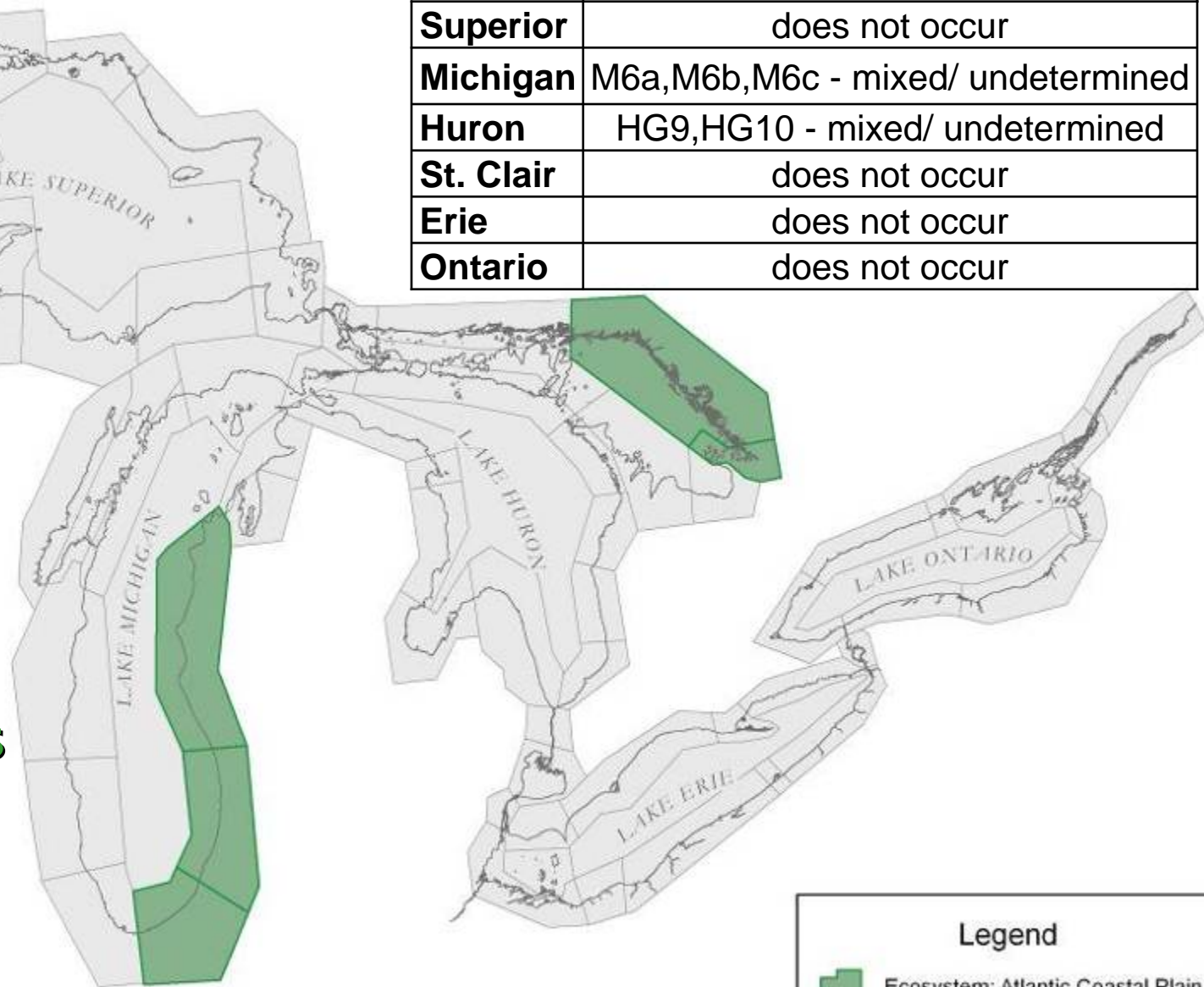
Atlantic Coastal Plain Disjuncts
Sandy Island, Georgian Bay

- Globally rare
- Limited by specific habitat requirements
- Not restricted to Great Lakes shores

Coastal Ecoreaches - Status/Trend

Superior	does not occur
Michigan	M6a,M6b,M6c - mixed/ undetermined
Huron	HG9,HG10 - mixed/ undetermined
St. Clair	does not occur
Erie	does not occur
Ontario	does not occur

Atlantic Coastal Plain Disjunct Communities



Scale 1:5,200,000

Legend

-  Ecosystem: Atlantic Coastal Plain
-  Great Lakes Shoreline
-  Coastal Reach

Coastal Forests



Coastal Forest
Trout Bay, Lake Superior



Coastal Forest
Georgian Bay

- Coast influences structure and composition
- Important for migratory species
- Biomass transfer from lake to land

Coastal Forests

	% of Coast (2km inland) - Status/Trend
Superior	80.1% - good/ improving
Michigan	28.9% - mixed/ deteriorating
Huron	59.9% - mixed/ improving
St. Clair	9.5% - poor/deteriorating
Erie	14.2% - poor/deteriorating
Ontario	24.0% - mixed/ unchanging



Scale 1:5,200,000



Pressures

- Coastal Development
- Invasive Species
- Recreational Use
- Shoreline Alterations



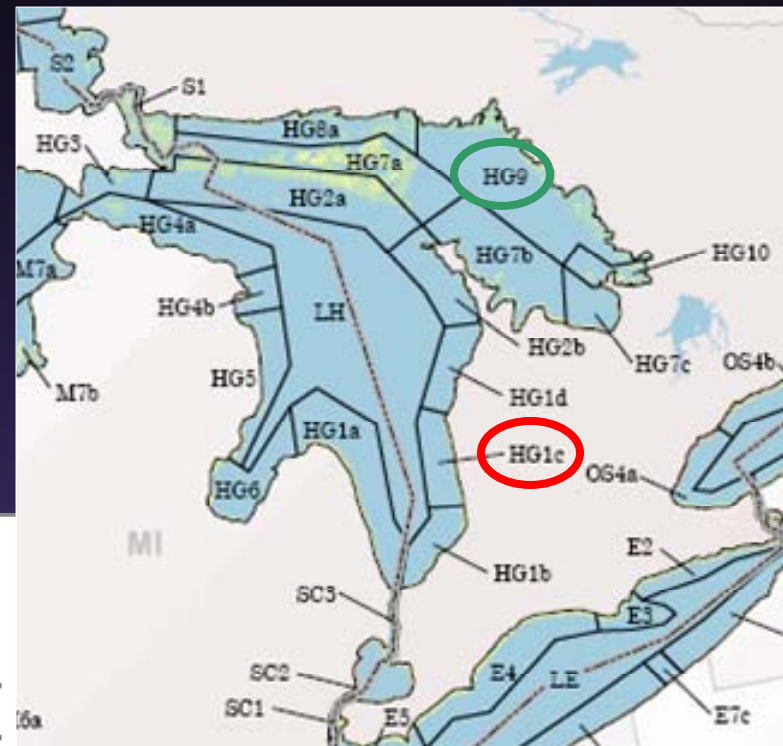
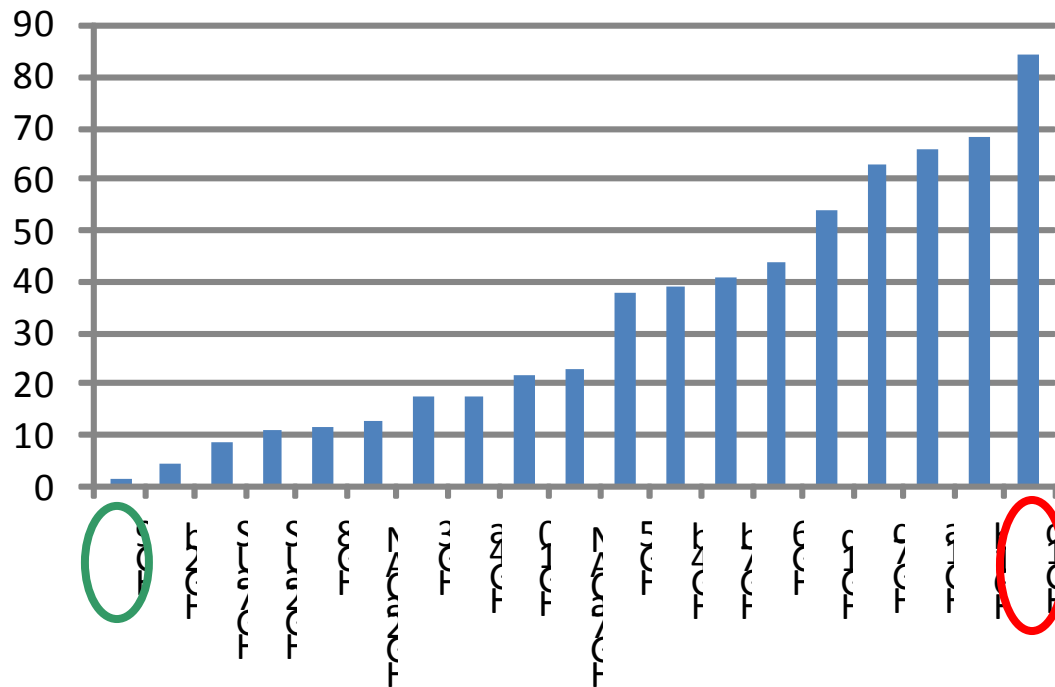
Coastal Pressure Index

- Index based on land use and shoreline alteration
- Applied to each coastal ecoreach



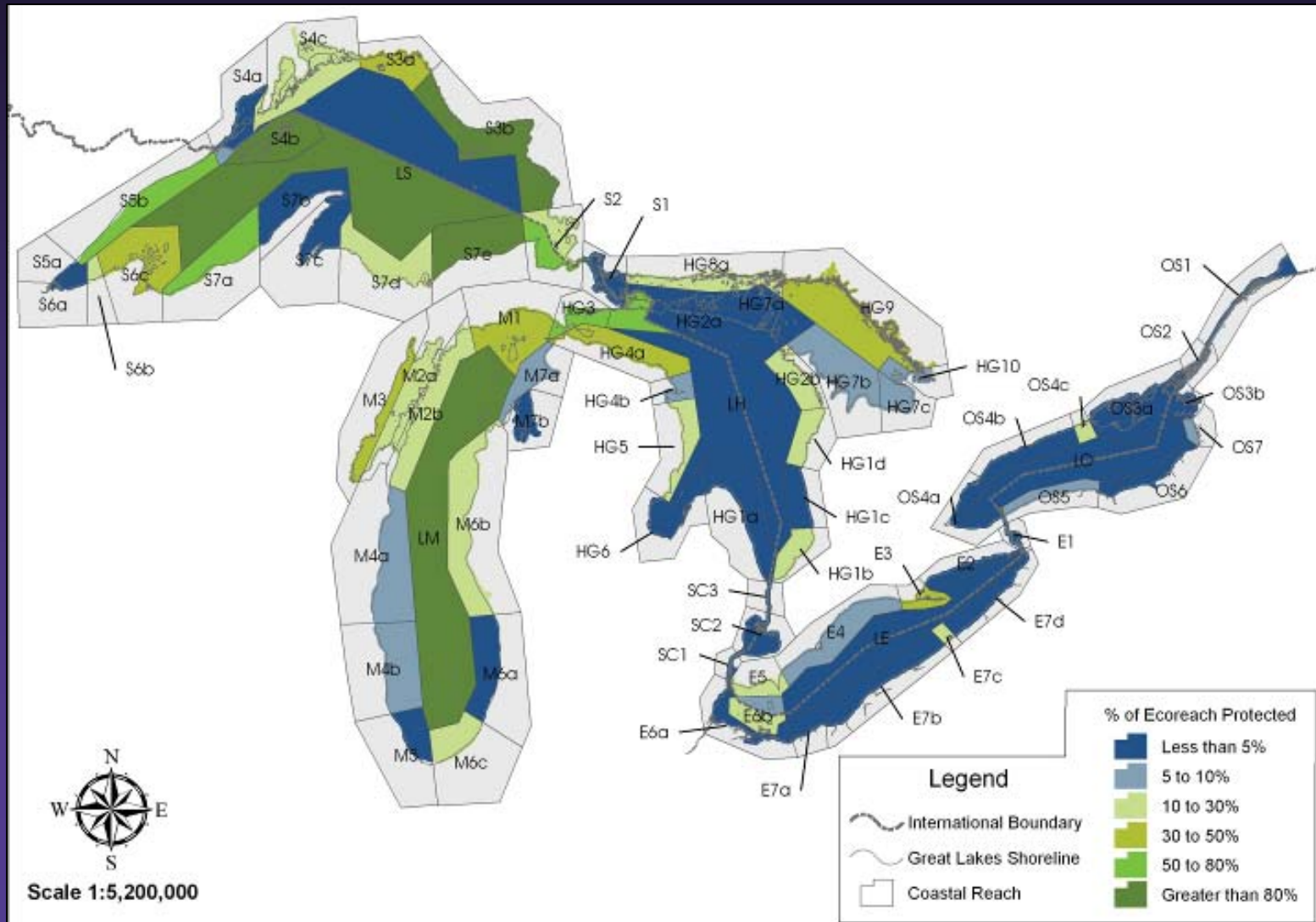
Coastal Pressure Index

Pressure Index



■ Pressure Index

Land Protection

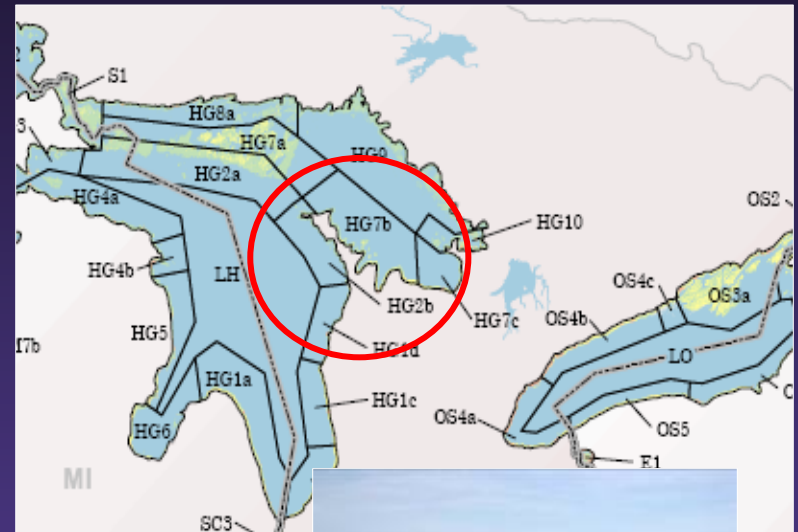


Management Implications

Coastal Ecoreach Report Cards

e.g. Western Bruce Peninsula (HG2b)

- 428.62 km
- Bedrock shore: dominant (~50%)
- Cobble beach: uncommon (~8%)
- Sand beach: very rare (<1%)
- Shoreline Cliff: rare (<4%)
- Four Coastal Alvar Types documented
- Approximately 19% of coast is protected.
- Coastal Pressure Index: Lower - 4.9
(range 0-193.6; median=44)



Management Implications

Need Binational Coastal Terrestrial Classification System

- Build on existing information in NatureServe

Identify gaps in protection

- Representation at different spatial scales



Management Implications

- Key stewardship opportunities
- Good baseline of distribution and status



Acknowledgments



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