Continuous Environmental Systems (CES) Management in Ontario: A Review of Lake Huron's Shoreline Governance

Background

Shoreline protection

- Is ongoing for maintenance and reassessment
- Is affected by climate change impacts such as increased storm intensity and reduced ice coverage
- Is managed individually in most cases
- Is subjected to ripple effects within its reach

Shorelines are CES:

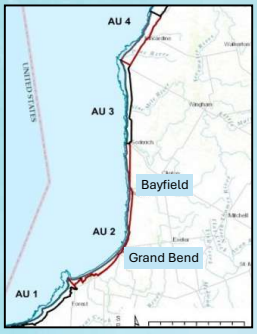
CONTINUOUS
Spanning across political boundaries

ENVIRONMENTAL
Incorporate ecological and social elements

SYSTEMS
Sections of the shoreline interact with each other

Ripple Effects [1]

- Indirect consequences of an action that propagate through connected systems
- A seawall in Bayfield (AU2) may reduce sediment deposition in Grand Bend (AU2)

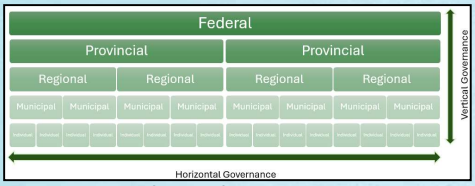


AU (Assessment Units) are littoral zones, lake segments within which sediment moves [2]

Results

Multi-level governance in Ontario

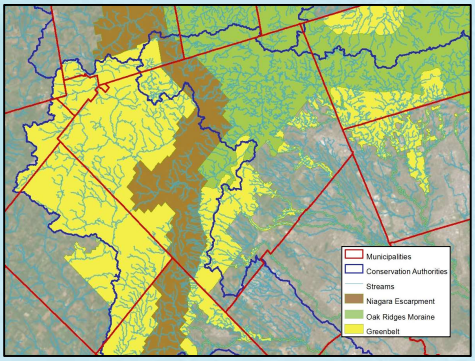
- "Hard borders" continuing from top to bottom
- Transboundary issues become the concern of the lowest encompassing institution
- Local knowledge and ties fade towards higher tiers



Multi-level governance in Ontario and Canada

CES Multiplicity

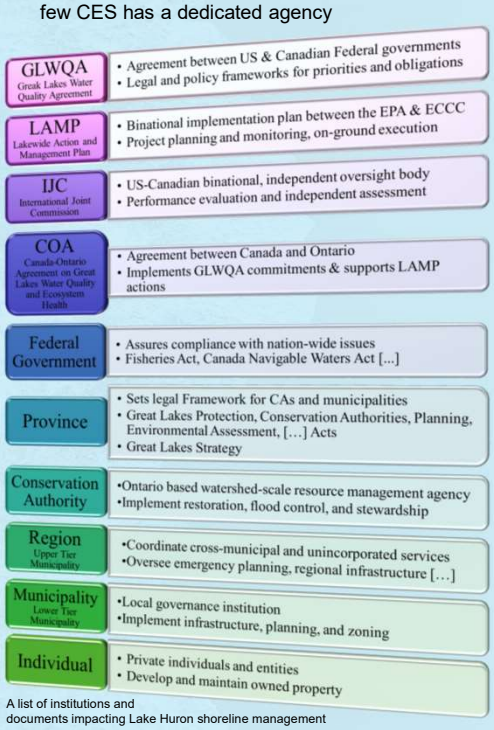
- Multiple CES may overlap
- CES specific acts can form a convoluted web
- Neglects non-prioritized CES



Municipal boundaries over CES with dedicated agencies and stream systems informing Conservation Authorities.

CES Complexity

- CES cross up to international borders, resulting in a mixture of high-level policy, yet vast differences between neighbouring properties
- Some ripple effects and local needs are neglected
- CES specific agencies address these issues, but few CES has a dedicated agency



A list of institutions and documents impacting Lake Huron shoreline management

Methods

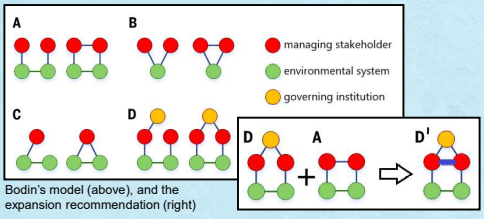
Policy Analysis

1) Assessing lakeshore protection implementation by following property owners' processes
2) Investigating how related policy is informed by local, regional, national, and international scale actors
3) Comparing CES with dedicated agencies (Conservation Authorities) to CES without
4) Applying Bodin's[3] model for social-ecological systems to highlight inefficiencies of polycentric governance and issue-specific institutions

Discussion

Bodin's System Governance [3]

- Recognizes stakeholder cooperation and institutional oversight of systems management
- Expanded to institutionally organized collaboration



Bodin's model (above), and the expansion recommendation (right)

Geographic Governance

- A social web mimicking the CES's geography
- Utilizing existing regulatory bodies to encourage and passively supervise collective implementation

Commoning

- Building relationships for cooperative management at the stakeholder level
- Combining large scale needs with local interests
- Stakeholder inclusion for positive change potential [4]

[1] Dean, R.G., Walton, T.L., Rosati, J.D., Absalonsen, L. (2013). Beach Erosion: Causes and Stabilization. In: Finkl, C. (eds) Coastal Hazards. Coastal Research Library, vol 1000. Springer, Dordrecht.
[2] Lake Huron Coastal Centre (LHCC). (2019). Coastal Action Plan for the Southeastern Shores of Lake Huron. Goderich Ontario.
[3] Bodin, Ö. (2017). Collaborative environmental governance: Achieving collective action in social-ecological systems. *Science*, *357*(6352), eaan1114.
[4] Harris, D. M. (2021). Storying climate knowledge: Notes on experimental political ecology. *Geoforum*, *126*, 331–339.