### EPA Great Lakes Coastal Wetland Monitoring Program

Dr. Donald G. Uzarski

Institute for Great Lakes Research, CMU Biological Station, Department of Biology, Central Michigan University, Mount Pleasant, MI 48859





## Presentation Outline

- Introduce the Great Lakes Coastal Wetlands Consortium (GLCWC)
- Current 10 year \$20M basin-wide monitoring program
- Examples of results to date
- Database access





- GLNPO RFP for \$1.2 million (+600K Supplemental) in 2000
  - In response to SOLEC 96' and 98'
    - Indicators of ecosystem health
  - Develop Bi-national standardized monitoring program based on SOLEC indicator
    - Few, if any, SOLEC indicators were developed



- 2000 Consortium was formed
- Joint facilitation GLC and GLNPO
  - 150 + Participants
    - 50 organizations (Federal, State/Provincial, Academic, NGOs)
- 2000 Consortium put out an RFP
  - Develop and evaluate metrics and protocols for measuring ecosystem health





- Development and Evaluation Process had to Consider:
  - Cost
  - Measurability
  - Basin wide applicability
  - Data availability
  - Sensitivity to change
  - Endpoint levels
  - Statistical approach
- Six proposals were selected by peer review



- Six proposals
- Conducted Pilot Studies 2002
  - Bain et al. (Ontario)
  - de Szalay et al. (Erie)
  - Ingram et al. (Ontario)
  - Timmermans et al. (Erie)
  - Uzarski et al. (Michigan & Huron)
  - Wilcox et al. (Michigan)





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Combined data
 + Uzarski et al. Superior

- » Consortium Submitted Final Product to US EPA March 2008
- » http://www.greatlakeswetlands.org
- » GLRI- GLNPO RFP for \$10M to Monitor Coastal Wetlands using GLCWC protocols 2009
- » Awarded in 2010
- » 2015 Received Another \$10M to continue years 6-10

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- Sample Every Coastal Wetland in Basin
  - >4 Hectares in Size
  - Surface Water Connection

Kitometern

Barrier (protected) Lacustrine (coastal) Riverine

## Current Research Measure Ecosystem Health Every 5 years sample ~1039 Coastal Wetlands

- Chemical/Physical Uzarski et al. 2008
- Invertebrates Uzarski et al. 2004
- Fish Uzarski et al. 2005
- Plants Albert 2008
- Birds Grabas et al. 2008
- Amphibians Timmermans et al. 2008
- Landscape Bourgeau-Chavez et al. 2008











## Quantify Ecosystem Disturbance

- Extremely Degraded: (0 to 15% of possible score)
- Degraded: (>15 to 30% of possible score)
- Moderately Degraded: (>30 to 50% of possible score)
- Moderately Impacted: (>50 to 70% of possible score)
- Mildly Impacted: (>70% to 85% of possible score)
- Reference Conditions: (>85 to 100% of possible score)



#### Currently Working on 10 Year \$20 Million Research Project



teams, 2001-2006. Locations of this proposal's collaborating teams are also shown.

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## Statistical Design

- » Maximize efficiency in detecting both
  - » Status
  - » Trends
- » Status and Trends are conflicting goals



# Sampling Design

- » Randomly Selecting Wetlands to Sample
  - Re-sample Subset Two Consecutive Years
- » Stratify by Region by Lake
- » Design Superior to Others
  - Good Estimate of Variation in Wetland x Year Interaction.
  - Eventually Sample Many Different Sites
  - Less Impact on Wetland from Over Sampling
    » Sampling Year after Year = Disturbance

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## IBIs using Different Indicator Groups

- Indicate disturbance at different scales
  - Plant = coarse scale
  - Invertebrates = local scale
  - Fish = intermediate scale
- Individual wetland does not experience disturbance uniformly
  - Based on hydrology
  - Gradient from terrestrial to true aquatic

























## Results 2011, 2012, 2013



## Results 2011, 2012, 2013















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Great Lakes Coastal Wetland Monitoring Program (CWMP) Mapping Tool





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Great Lakes Coastal Wetland Monitoring Program (CWMP) Mapping Tool



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# Accessing the Database

- USEPA and Project Researchers
  - » Full Access to Raw and Analyzed Data with Manipulation Capabilities
- State and Federal Wetland Managers
  - » Access to Some Raw and All Analyzed Data
- NGOs Working on Restoration and Conservation
  - » Full Access to Analyzed Data (and Case by Case for Raw Data)
- General Public
  - » Access to Summarized Analyses







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