EPA Great Lakes Coastal Wetland Monitoring Program

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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
The Great Lakes Coastal Wetlands Consortium

- 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
The Great Lakes Coastal Wetlands Consortium

- 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
The Great Lakes Coastal Wetlands Consortium

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
The Great Lakes Coastal Wetlands Consortium

- 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)
The Great Lakes Coastal Wetlands Consortium

- Six proposals

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  - Wilcox et al. (Michigan)

Combined data + Uzarski et al. Superior
The Great Lakes Coastal Wetlands Consortium

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

University of Minnesota-Duluth
Northland College
University of Wisconsin
Grand Valley State University
Lake Superior State University
University of Notre Dame
Michigan DEQ
USGS
LimnoTech
Environment Canada
Bird Studies Canada
SUNY-Brockport
University of Windsor

GLIC-Wetland Monitoring Map: Location of Great Lakes coastal wetlands previously sampled by GLCWC and GLEI teams, 2001-2006. Locations of this proposal’s collaborating teams are also shown.
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
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]
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
Fish Indicator 2011-2015

- High Quality/Reference Condition
- Mildly Impacted
- Moderately Impacted
- Moderately Degraded
- Degraded

Legend:
- Green: High Quality/Reference Condition
- Orange: Moderately Impacted
- Yellow: Moderately Degraded
- Red: Degraded

Map of the Great Lakes showing distribution of fish indicators.
Results 2011, 2012, 2013

Number of Wetlands

Number of Non-native Plant Species

0 1 2 3 4 5 6 7 8 9
Results 2011, 2012, 2013
EPA AWARDS CMU $20 MILLION IN SIX YEARS for Great Lakes research
Welcome to the Great Lakes Coastal Wetland Monitoring Program (CWMP) website, Don!

You are currently logged in as 'users/dg@cmich.edu'. Your account has 'Admin' privileges, including access to the following site features:

- **Mapping Tools**
  - Wetland IBI visualization tool
  - Decision Support Tool (DST)

- **Data Retrieval Options**
  - Download raw data
  - Download query results
  - Download semi-annual data releases

- **Data Entry/Editing Pages**
  - Vegetation
  - Fish/Invertebrates/WIF
  - Amphibian
  - Wetland Bird
  - Upload GPS files (.gpx)

- **Administrative Pages**
  - Manage user accounts

CWMP Site Links:
- Home Page
- Site Mapping Tool
- Reports & Publications
- Sampling Protocols
- GIS Help Topics
- Inset Help Centers
- Collaborating Institutions
- Download Raw Data
- Download Query Results
- Decision Support Tool (DST)

Data Entry & Editing:
- Vegetation
- Fish/Invertebrates/WIF
- Amphibian
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- Upload GPS files (.gpx)

Other Relevant Links:
- CMU GIS Home Page
- CMU Home Page
Great Lakes Coastal Wetland Decision Support Tool (CWDST)
Great Lakes Coastal Wetland Monitoring (CWM) - Map Data Download

Please select from the following data release options and then click the 'Download File(s)' button to initiate the download:

- Export raw data in Microsoft Excel spreadsheet format ("*.csv")
- Download prior day's export ("*.csv")
- Download up to one day export ("*.csv")

Download File(s)
Great Lakes Coastal Wetland Monitoring (CWM) - Map Data Download

Please select from the following data release options and then click the 'Download File (x)' button to initiate the download:

- Export new data in Microsoft Excel spreadsheet format (*.xlsx)
- Download prior day's export (*.txt)
- Download up to 30 days export (*.txt)

Download File(s)
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
Collaborators

Central Michigan University

Department of Environmental Quality

Natural Resources Research Institute

University of Notre Dame

University of Wisconsin–River Falls

Grand Valley State University

Northland College

University of Windsor

Lake Superior State University

University of Wisconsin Green Bay

LimnoTech

The College at Brockport

University of Wisconsin Superior

Bird Studies Canada

Environment Canada

Environment Canada
Special Thanks to Our Sponsor and Partner:
Cooperative Effort

Great Lakes RESTORATION

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