Measuring for Management: The Great Lakes Observing System
A Collaborator & Facilitator for Data Collection, Management and Integration in the Great Lakes Region

Wednesday, May 7, 2014
Great Lakes Workshop Series on Remote Sensing of Water Quality, 2

Jennifer Read, Executive Director
GOALS

• Increased familiarity with Great Lakes Observing System
• Increased understanding of GLOS mission and approach
• Piqued interest in partnering with GLOS
Overview

• What is GLOS?
  – Role
  – Activities

• GLOS and You

• Ways to Engage
The FOUR V’s of Big Data

Volume

6 BILLION PEOPLE have cell phones
WORLD POPULATION: 7 BILLION

60 ZETTABYTES
(43 TRILLION GIGABYTES)
of data will be created by 2020, an increase of 300 times from 2005

Scale of Data

40 ZETTABYTES
(43 TRILLION GIGABYTES)
of data are created each day
2.5 QUINTILLION BYTES
(2.3 TRILLION GIGABYTES)
of data stored

2020

1.9 MILLION IT JOBS
will be created globally to support big data, with 1.9 million in the United States

By 2015

Modern cars have close to 100 SENSORS that monitor items such as fuel level and tire pressure

Velocity

ANALYSIS OF STREAMING DATA

The New York Stock Exchange captures 1 TB OF TRADE INFORMATION during each trading session

Variety

DIFFERENT FORMS OF DATA

As of 2011, the global size of data in healthcare was estimated to be 150 EXABYTES (161 BILLION GIGABYTES)

30 BILLION PIECES OF CONTENT are shared on Facebook every month
30 BILLION HOURS OF VIDEO are watched on YouTube each month
400 MILLION TWEETS are sent per day by about 200 million monthly active users

3 IN 4 BUSINESS LEADERS don’t trust the information they use to make decisions

Veracity

UNCERTAINTY OF DATA

By 2015, it's anticipated there will be 4 BILLION WEARABLE, WIRELESS HEALTH Monitors

3 IN 4 BUSINESS LEADERS don’t trust the information they use to make decisions

27% OF RESPONDENTS in one survey were unsure of how much of their data was inaccurate

Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPTEC, GGI

INTEGRATED OCEAN OBSERVING SYSTEM
GLOS
A Global Voice for the Great Lakes

The Global Ocean Observing System (GLOS) and the Integrated Ocean Observing System (IOOS) work together to provide a coordinated approach to ocean monitoring and data integration, fostering a global voice for the Great Lakes and other oceanic regions.
Connecting data users to data providers in ways that support management and policy decisions.
GLOS ACTIVITIES
Focus Areas

ECOSYSTEM HEALTH
– Fisheries, Areas Of Concern (AOC)/LaMPs

MARITIME OPERATIONS
– Recreational boaters

PUBLIC HEALTH & WATER SECURITY
– Beach managers, water intake operators

CLIMATE CHANGE ADAPTATION
– Municipal water infrastructure managers
Remote Sensing

- Physical Obs – wind, waves, temp
- Lake Bottom Mapping
- Lake Ice
- Shoreline Mapping
- Lake Quality

OBS Subsystem
Data Management

- Data Infrastructure
  - Hardware
  - Software – US IOOS / regional
- Applications
  - Data Storage and retrieval
  - Viewers and access
Models

- Currents, water levels, waves, pollution tracking, sediment, temperature

- Real-time models (24/7)
  - Nowcast (current conditions)
  - Forecasts (up to 120 hours)
  - Scenarios (past, future-climate)

- Beach-scale to Lake-scale

MODEL Subsystem
Facilitation & Coordination

• Ecosystem Forecasting
• GEO Great Lakes
• Regional communities of practice, e.g., Observations, Data management
• Adaptive Management
It All Fits Together…

Feedback

Management/Storage
- data integration
  - retrieval/input tools
  - conversion tools
  - catalog tools
- standardized data
- current data storage and access
- long term archives

Delivery
- visualization tools and access products
- data analysis: models, processors and applications

Retrieval
- observations
  - raw data
  - processed data
  - model outputs
- computer models
  - processed data
  - model outputs
GLOS and YOU: Data Users

• GLOS Data Portal
  – Melding Obs Explorer and Data Catalog into one product

• GLOS metadata
Metadata

• Metadata allows users to find and link to useful data
• Linked from Data Portal Search Results
• Standardized and ISO compliant
• GeoNetwork – registered with GEOSS
GLOS and YOU: Data Provider

- GLOS is a distributed system
- Connect to GLOS = connect to GEOSS
- Contact dmac@glos.us

- But what about other ways to engage?
# Points of Entry

## GLOS Planning and Evaluation Cycle

<table>
<thead>
<tr>
<th>Month</th>
<th>Year 1 Implement</th>
<th>Year 2 Analyze and Adapt</th>
<th>Year 3 Analyze and Adapt</th>
<th>Year 4 Set Priorities</th>
<th>Year 5 Develop Strategies</th>
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</thead>
<tbody>
<tr>
<td>Jan</td>
<td>Finish Previous Cycle Implementation</td>
<td>Re-Scope Yr 1 Annual Plan</td>
<td>Re-Scope Yr 3 Annual Plan</td>
<td>Re-Scope Yr 4 Annual Plan</td>
<td>Re-Scope Yr 5 Annual Plan</td>
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<td>Feb</td>
<td>Re-Scope Yr 1 Annual Plan</td>
<td>Re-Scope Yr 2 Annual Plan</td>
<td>Re-Scope Yr 3 Annual Plan</td>
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<td>May</td>
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<td>June</td>
<td>Begin New Cycle Implementation</td>
<td>Progress Updates and Evaluation</td>
<td>Project Evaluation &amp; Strategic Plan Update</td>
<td>Complete Strategic Plan update</td>
<td>Review and select project proposals – Tech Advisory Committee</td>
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<td>July</td>
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<td>Aug</td>
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<td>Develop IOOS proposal</td>
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<td>Sep</td>
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<td>Oct</td>
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<td>Submit IOOS proposal</td>
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<td>Nov</td>
<td>Project Presentations</td>
<td>Project Updates</td>
<td>Evaluation &amp; Planning</td>
<td>Promote Strategic Plan</td>
<td>In Review- Success Stories</td>
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<td>Dec</td>
<td>Semi-Annual webinar (June) and Annual (November) meetings – opportunities for Stakeholder and Industry to meet/provide input</td>
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Thank You

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