

Start-Up Meeting for the Great Lakes Observing System (GLOS)

Participants:

Paul Scholz – NOAA-CSC (by phone)
Mike Donahue – GLC
Roger Gauthier – GLC
Christine Manninen – GLC
Steve Brandt – CGLRM, NOAA-GLERL
David Schwab – NOAA-GLERL
Jennifer Werner – NOAA-COOPS
Tom Johnson - Univ. of Minnesota Large Lakes Observatory
Joe DePinto – Limno-Tech, Inc.
Sam Batzli – Univ. of Wisconsin-Madison, Environmental Remote Sensing Center
John Kaschik – USACE
Dick Wagenmaker – NOAA-NWS
Mark Burrows – IJC Windsor, CGLRM
Keith Bedford – Ohio State Univ.
Jon MacDonagh-Dumler – GLC
Tom Rayburn – GLC
Dave Knight – GLC
Chris Guenther - GLC
Stuart Eddy – GLC
Mark Bobal – USCG
Rao Manam – USACE (by phone)

Overview of IOOS:

Paul Scholz: GLOS is to be a regional component in the Integrated Ocean Observing System (IOOS) being developed under the coordinative efforts of the National Oceanographic Partnership Program (NOPP). Twelve Federal agencies are formally part of NOPP, with primary funding coming from Dept. of Defense and NOAA-Coastal Services Center. Detailed information about the NOPP program and its resources is available at <http://www.ocean.us>

At this point, there are six regional associations pending and one pilot project, the Gulf of Maine Ocean Observing System (GoMOOS), under way. GLC has won approval to coordinate development of a business plan for a Great Lakes regional association to develop and sustain a Great Lakes regional observing system.

CSC envisions its role as one of providing access to information and facilitating communication between regional associations around the country. To date, there has been a great deal of discussion about parameters to be measured, types of sensors to put in the water, data sharing requirements, etc. There has been very little discussion of regional governance structures or how those will feed up into a coordinated national system.

Questions:

Is there an identified role in the regional observing system for the CSC?

There is no defined role. CSC is providing "support and technical assistance to regional associations and Ocean.US" without anything written in stone about what that means.

What is the IOOS timeframe?

Academic interest has been high for about 20 years. Congressional action started taking place 2 or 3 years ago. CSC thinks they have 2 to 3 more years to get the regional associations embedded in the federal process and budgets.

When did the regional association projects start?

Funding became available starting last year. The main link for most background information is Ocean.US.

The GLOS proposal included some discussion of data parameters. Are these elements in synch with discussions going on in other regions?

This money is really for establishing partnerships and governance, and not for establishing an operational system.

What should we be doing now to take care of operational details?

That will come with time, which is to say that there is no set protocol. The organizing process will get us there.

Paul Scholz remarked that he was surprised that there no Coastal Managers on the participants list. They will be part of the business plan development process, but the person who was invited could not attend this meeting.

Review of GLOS Proposals:

Note: This presentation is online at http://www.glc.org/glos/pdf/glos_projectoverview.pdf

Task categories as listed in proposal to develop GLOS business plan:

- 1: Convene steering committee
- 2: Identify regional associates and user/stakeholder communities
- 3: Conduct thematic workshops:
 - open lake processes
 - interconnecting waterways
 - research
 - remote sensing
 - coastal/municipal/beaches
 - biology
- 4: Develop initial GLOS web pages
- 5: Conduct GLOS conference
- 6: Business plan development

Primary product will be comprehensive business plan for GLOS that addresses the following:

- Governance
- Operational Characteristics
- Roles and Responsibilities of Associates
- Funding mechanisms to maintain data collection and transmission networks
- Information integration and retrieval
- Modeling and Analyses
- Communications and Outreach

Funded through Sept 2004, with total budget of approx. \$100K.

Year Two Outlook:

New funding proposals have already been requested. A proposal was submitted to CSC on October 30, 2003, requesting funds to continue the GLOS effort through a second year. Focus of the second year as proposed would be development/implementation of the regional association per the business plan being developed under Year One.

Year Two Tasks (October 2004 – September 2005):

- Formalize relationships among regional associates
- Initiate regional NVODS node
- Implement data synthesis demonstration (proposed western Lake Erie and Detroit-St. Clair River system)
- Implementation planning
- Advance communications
- Address sustainability issues

The demonstration project proposed for Year Two will include only existing data sets as a means of testing information integration capabilities from multiple agencies.

Year Two is not yet funded. The total request is just under \$100K.

The thematic workshops during Year One will focus on two areas: Assessing existing resources and collecting information about needs from potential user communities. Questions about the sustainability of a regional association will also be important. We are unlikely to ever be looking for funding for the entire system as a standalone entity, so cooperation will be crucial.

Regarding the Year Two Demonstration Project, Joe DePinto remarked that we may need to focus the pilot project on one particular type of information and test the process rather than trying to provide a useful product. This may make it easier to focus on issues of cooperation and synthesis and then apply those lessons to all the other types of data and eventually to other geographical areas.

From Mark Burrows: Work with the monitoring efforts early. They are a starting point, and their existing architecture is a good example of what we may be building on.

Council of Great Lakes Research Managers Perspective:

Note: This presentation is online at http://www.glc.org/glos/pdf/cglrm_ppt.pdf

IJC has been interested in the GLOS topic for some time. CGLRM has a 2-3 year background in involvement on this issue and a published priority from the IJC to promote development of an Integrated Great Lakes Observing System.

The two primary needs are coordination of existing observing systems and development of in-lake capabilities.

Overall goals:

- Collect long-term data on physical, biological, chemical and meteorological conditions
- Develop versatile, portable observatories
- Deploy observatories and integrate observations
- Develop partnerships to operate and maintain the observatories
- Develop real-time display and dissemination tools for the user community

The technology to meet these goals already exists. Funding and a regional infrastructure are the main outstanding needs.

Next steps:

- Work with users to identify needs
- Identify technological capabilities
- Work with existing GL structures to identify partners
- Have a workshop with some goals:
 1. Assess technology
 2. Assess transmission and sharing capabilities
 3. Get people with authority involved

Funding (\$20K) for such a workshop is available through the National Sea Grant Program and the IJC-CGLRM, and CGLRM wants to use that workshop in conjunction with the GLOS business planning process to advance the effort at developing a business plan and a functional regional association. Colleagues in the effort are NOAA's Undersea Research Program and Wisconsin Sea Grant.

Several people stressed the importance of open lake measurement capabilities. Near shore, streams, and coastal issues are already receiving at least some attention (including most SOLEC indicators), and all are impacted by open lake conditions, yet there is a significant gap in open lake measurements (no single-moment snapshots possible except with satellite imagery, and the locational distribution of all sensor platforms is sporadic at best). As Tom Johnson put it, most researchers run around pleading "Give us more" (dollars, data, etc.), while open lake people are still pleading "Give us some."

What is cost of platform we saw? \$40-60K (for shallow water). A Lake Superior device would be \$100K, just for equipment. NOAA does have buoys and some expertise on operating a

reporting station in open water. Existing buoys have initial cost of \$100K and operational cost of \$50-70K per year. None of these systems (buoys or new lakebottom sensors) are designed to be used in the winter.

Vision and Scope:

People present at the meeting were asked to present their visions of a Great Lakes Observing System:

Tom Rayburn, GLC: Real-time information combined and synthesized to effectively serve multiple diverse user communities. Emergency responders will be an important community. Isle Royale ecosystem threats and Rouge River oil spill also highlight needs for monitoring capabilities.

Dave Knight, GLC: Interested in providing ship operators and shipping system with safe and efficient system.

Tom Johnson, University of Minnesota-Large Lakes Observatory: Has been deploying moored sensing devices in Lake Superior for 6 years. They are getting new data that shows stuff we aren't measuring with research vessels. Has academic perspective, so is focused on academic research priorities. Wants systems on all lakes and not just those with more population around them. Regarding users and perceived needs of users, the people who are concerned are understandably focused on basin issues. But we must also emphasize the open water areas. We don't see changes there, but they are very important. The Gulf of Maine observing system is a great example of where open water technologies and capabilities can take us. This is very academic, but the fishing community is getting involved. He stressed the need to address open water observations (or rather, the lack of them).

Christine Manninen, GLC: Coming at the issue from an information management standpoint. Work on the water level monitoring system and a project involving web-based display of that information shows the lack of synthesis. She sees a huge need for one-stop shopping for information.

Joe DePinto, Limno-Tech: Interested in more data for modeling. Synthesis really means providing information as opposed to raw data, and information needs to be presented in a modeling framework that really helps us understand what's happening. Long-term visions should include modeling.

Sam Batzli, University of Wisconsin-Madison Environmental Remote Sensing Center: Is currently tracking water clarity in Green Bay and other areas and some new sensors which are capturing new information that they didn't get before. Has some experience with data distribution from satellite remote sensing projects. GLOS should provide frequent information for research purposes.

John Kaschik, USACE: The Corps of Engineers is concerned with flows and levels. Is the hydraulic monitoring agency for GL channels, so is concerned about velocity information which

will help with modeling. Is learning today about data sources that he didn't know existed, so he agrees with the need to consolidate data. Seconds Joe... make data available, but also synthesize it for users.

Roger Gauthier, USACE and GLC: Hydrologic data collection and forecasting, supporting development of hydrodynamic modeling and remote sensing. Currently responsible for regional data management from GLC perspective. Is very interested in operational dynamics and overall vision for the system, and thinks that we need to do everything else in addition to open water measurements. Is also currently involved in air deposition and thinks that air should be part of the system—example, lake trout decline has been linked to dioxins in the air. Monitoring is often under-funded and underappreciated and we need to get together to develop a stronger advocacy approach.

Jennifer Werner, NOAA CO-OPS: Data provider's point of view. Brings experience in data provision and sharing.

Jon MacDonagh-Dumler, GLC: Regional coordination focus. Is interested in development of coherent data sets which leads to coherent public policy.

Stuart Eddy, GLC: Data consolidation issues rising out of GIS coordination work. Would like to see information sharing that expands and enables modeling, data acquisition (for people who aren't getting the data now), and new types of coordination among players that serve coherent decisionmaking.

Steve Brandt, NOAA-GLERL: NOAA runs a lot of observing systems, all run by independent subagencies. They are now looking at regional approach to monitoring, and the Great Lakes area is a pilot region. They are interested in multiple one-stop shopping. You want constant feedback from users, and that is better managed and used with multiple sites instead of one. User communities want specific information, so integration is very complicated. GLERL is focused on ecosystem forecasts.

David Schwab, NOAA-GLERL: IOOS has information and parameters in their literature and will guide development. Everyone who's involved should read these. Would like to see four components: Physical observing system, data acquisition-archiving-communications, modeling and data assimilation, and research. Does not see an entity with all these components, so is interested in the formation of the regional association. GLERL also adds experience with the type of observing that is needed, so this is an opportunity to build on that system. Is also interested in connections with user community.

Dick Wagenmaker, National Weather Service-Detroit: NWS provides and uses data and is very interested in this process. They have already worked to put lots of data on one screen for forecasters. Echoes Steve's concerns about issues of data integration, but is excited that we can move forward.

Mark Burrows, Council of Great Lakes Research Managers: Interested in decision management/support and science-policy linkage. Also focused on the binational connection.

Brings feedback from Canadian players who are concerned that user communities really define the needs, and that we do "intelligent vetting" to present useful information to users.

Keith Bedford, Ohio State University: Helped to start Great Lakes Forecast System and has dealt a lot with user issues. Is concerned about the assumption that all this data is free, but is concerned that the user community needs to know that this needs to be funded in perpetuity. There needs to be commitments of funding. Need to fuse stakeholders to the process so that existing funding streams are not threatened.

Rao Manam, USACE: Everyone has given their wishlist, but the devil is in the details. We need more information about the work that is being done now and what is planned for the coming years. Get everyone to put their information on the table. Put it on paper and create a report for the assessment process.

Prospective Regional Associates:

Characteristics

Roles during Business Plan development and initial implementation efforts:

- Assist in identifying and delineating data, system components and long-term capabilities of the system
- Data provider, significant economic stakeholder (may not produce but is willing to fund), raw data user

Where possible, Regional Associates should be a signature authority (though the definition of this will vary greatly depending on need, e.g. data access vs. funding).

GLOS planners will need to clearly understand agency hierarchies.

The plan needs to maintain good alignment with the Ocean.US IOOS framework.

Federal Agencies

Canada

Canadian Coast Guard

Canadian Hydrographic Service

Department of Fisheries & Oceans

– Marine Environmental Data Service

Environment Canada

– National Water Research Institute

Natural Resources Canada

Transport Canada

Construction Mgmt. Authorities along GL/St. Lawrence R.

United States

National Oceanic & Atmospheric Admin. (22 Great Lakes offices...)

– Coastal Services Center

– National Ocean Service

– National Weather Service

– GLERL

– National Data Buoy Center

– National Environmental Satellite, Data & Information Service

U.S. Army Corps of Engineers

- Buffalo District
- Detroit District
- Chicago District
- Hydrologic Engineering Center
- GIS/RS Center at CRREL
- Engineer Research & Development Center, Waterways Experimental Station (Vicksburg, MS)

U.S. Coast Guard

- District 9

U.S. Environmental Protection Agency

- Region 2
- Region 3
- Region 5
- GLNPO

U.S. Fish & Wildlife Service

- National Wetlands Inventory
- Great Lakes Basin Ecosystem Team

U.S. Geological Survey

- Great Lakes Science Center
- Water Resources Division
- Michigan District, Lansing (Jim Nicholas)

Department of Homeland Security

U.S. Navy

- Great Lakes Training Facility?

FEMA

National Science Foundation-Ocean Sciences Division (Alexandria Isern, Pgm. Mgr.)

First Nations

Walpole Island First Nations

Tribal resource mgmt. agencies

State/Provincial Agencies

Sea Grant Institutions

Coastal Zone Managers

Departments of Natural Resources

- MN DNR & Pollution Control Agency
- WI DNR
- MI DNR & DEQ

Ontario Ministry of the Environment

Water municipalities (supply & discharge)

Non-Governmental Organizations

Great Lakes Fishery Commission

International Joint Commission

St. Lawrence Seaway Devel. Corp.

St. Lawrence Seaway Authority

Utilities

Power, water treatment, ... (not fully explored at this point)

Academia

Univ. of Wisconsin-Milwaukee (Great Lakes Water Institute, Val Klump)

Univ. of Minnesota-Duluth (Large Lakes Observatory, Tom Johnson)

SUNY Buffalo

Ohio State Univ.

Univ. of Windsor GLIER

Univ. of Waterloo

Michigan State (fisheries)

Great Lakes Research Consortium

Upper Great Lakes Environmental Research Network

Lake Erie Millenium Network

Targeted User Communities**Characteristics**

Role: Provide information and advice to the Project Steering Committee on the use and application of observing systems data and information

Users of finished products

Possible categories

Commercial shipping (vessel operators, ports, agents)

Coordination: Dave Knight

Commercial and sport fishing

– Foundation of Ontario Hunters and Anglers

Coordination: Dave Knight, Roger Gauthier

Recreational boating

Coordination: Dave Knight, Roger Gauthier

Emergency response, law enforcement

(review parties listed in regional response plans)

Coordination: Tom Rayburn, Dick Wagenmaker

National security? National security planning?

Coordination: Tom Rayburn

Restoration management

Coordination: ?

Research (esp. coastal, offshore/open lake)

Coordination: Mark B.

P-16 education programs

Coordination: Christine M.

Beach managers

Coordination: Christine M.

Municipal utilities

Coordination: Dick Wagenmaker

Coastal engineers

Coordination: John Koschik

Industry

- pipelines, tunnels, NPDS-permitted
- power plants/utilities
- Sarnia/Chemical Valley Industries monitoring group

Coordination: ?

General public

Coordination: Dick Wagenmaker, Christine Manninen

Compliance-checking groups/agencies/organizations

Coordination: ?

Discussion of GLOS Governance Model:

Note: This presentation is online at <http://www.glc.org/glos/pdf/governance.pdf>

Governance refers to the policies and processes by which design, implementation, operation and improvement of the GLOS will be controlled and managed at both regional and national levels.

- A plan for governance will be essential in ensuring sustainability of GLOS after initial implementation
- GLOS is a volunteer collaborative
- GLOS will provide tangible benefits to Regional Associates and end users, which should be showcased
- Responsibilities of both data providers and users need to be clearly defined
- Groups involved need to be vested in the success of the initiative

Current Regional Associations and governance models

Gulf of Maine Ocean Observing System (GoMOOS: www.gomoos.org)

- 501c3, non-profit corporation
- As a working prototype, GoMOOS is partnering with other systems that will link together to create the NorthEast Observing System (NEOS) which extends from GoMOOS to New Jersey and on to the Carolinas

Southeast Atlantic Coastal Ocean Observing System (SEA-COOS: www.seacoos.org)

- Affiliate Members Committee with Board of Directors plus 6-8 Working Groups
- (these regions have good sites and are already starting to serve data and assimilate data)

Additional governance models

Coastal Alaska Observatory System (CAOS: <http://www.ims.uaf.edu/caos/index.html>)

- Acting Director (rotation among regional associate agencies)
- Governance and Implementation committees

Gulf of Mexico Coastal Ocean Observing System (GCOOS: http://ocean.tamu.edu/GCOOS/new_gcoos.html)

- Advisory Board (responsibility for ongoing coordination and representation)...plus Observing Systems Committee, Products and Services Committee, User Committee

- Considering formation of an informal regional alliance among signatories and/or becoming a 501c3 nonprofit.

Lessons from other Regional Associations

(see http://www.ocean.us/documents/doc/gomoos_lessons_learned.doc)

Criteria for Success

- Formalized partnerships established within a region
- Provision of an acceptable business plan
- Expected start-up costs and sustainability plans identified
- System should be capable of routine, sustained, 24-hour operations
- Data and information management structure identified
- System should offer free and open access to data collected
- Agree to adhere to standards and protocols
- Governance issues must be solved by the individual regional associations

GLOS governance questions to consider

- What will be the formal roles of Steering Committee? Regional Associates? User groups?
- Should federal agencies have a heightened role in GLOS hierarchy and decisionmaking?
- What should be the role of non-governmental entities (industry, academia, Native American tribes, etc)?
- How are differences between stakeholders (user groups) arbitrated?
 - data prioritization for the GLOS
 - implementation schedules
 - allocation of resources

Discussion

Who will do the "heavy lifting"? Should we be establishing a 501c3? What will guarantee sustainability? Gulf of Maine example is not perfect because they have been well funded and we don't know how long that will last. There is also a difference for GLOS in that we already have regional structures to work with.

Keith: Efforts will depend on our ability to avoid infighting, and governance must be structured along those lines.

Roger: Certain structures like the coordinating committee, GLC, and GLIN should be used as appropriate.

Prospective Workshops

Characteristics

Give them a structural focus aimed at defining the system's operational needs.

Do them by geographic and topical areas of data and users.

Most participants will both contribute to and be supported by the system.

Each workshop needs to include an emerging technologies element.

Each working group should put together a "straw man" document by the time they are done.

Workshops are 1 day in length.

Themes

Open Lake 1: Physics

Location: Great Lakes Science Center, Toledo, OH

Date: to be determined

Coordination: Keith Bedford

(CGLRM support?)

Interconnecting Waterways (Physics & Biogeochemistry)

Location: CCIW, Burlington, ON

Date: to be determined

Coordination: John Koschik/Roger Gauthier

Remote Sensing

Location: UW-Madison, WI

Date: to be determined

Coordination: Sam Batzli/Stuart Eddy

Coastal/Municipal/Beaches

Location: Indiana Dunes National Lakeshore

Date: Spring 2004

Coordination: Christine Manninen

Open Lake 2: Biogeochemistry

Location: Duluth, MN

Date: Late June 2004?

Coordination: Tom Johnson

(CGLRM support?)

Data Management

Location: Ann Arbor, MI

Date: to be determined

Coordination: Stuart Eddy

Overview of GLOS Approach — Presentation to/workshop with the research community?

Location: 1 day in conjunction with the IAGLR Conference in Waterloo, ON?

Date: IAGLR Conf = 5/24-28/04

Coordination: Joe DePinto? Pat Chow-Fraser (IJC)?

(CGLRM support?)

Funding note: IJC funds need to be expended by the end of March if possible. Trade funds?

Prospective Focus Groups

Characteristics

Discussions involving potential user constituencies such as the commercial maritime industry, recreational interests, municipal water managers, regulators, policy specialists, academia and the research community

Possible Themes/Events

Commercial Navigation

- Detroit/St. Clair Operations Group (Detroit, MI, 11/03)
- Great Lakes Marine Community Day (Cleveland, OH, 1/28/04)

Charter/Ferryboat Captains/Pilots

- Industry Days (Traverse City, MI; date to be determined)

Marine Spill Responders

- No Spills Conference (Traverse City, MI; date to be determined)

Recreational Boating

- events to be determined

Beach Managers

- events to be determined

(to be discussed at Great Lakes Beaches '03 Conference, Muskegon, MI, 10/21-22/03)

Municipal Water Managers

- events to be determined

Wetlands Researchers

- NY Wetlands Conference (Rochester, NY, 3/31 - 4/1/2004)

Public Safety

- events to be determined

Inaugural GLOS Conference

Location: Detroit, MI

Date: June 2004 (tentatively)

Other Events / Groups to Consider

Midwest Natural Resources Group Environmental Roundtable, Delavan, WI, 11/12-14/03

Water Environment Federation, TMDL 2003, Chicago, IL, 11/16-18/03

AWWA, New York Section, Tiffit Symposium, Syracuse, NY, 11/18-19/03

Great Lakes Basin Ecosystem Team meeting, Chicago, IL, 11/18-19 or 19-20

AWWA/Michigan Water Environment Association Joint Expo, Lansing, MI, 2/3-4/04

Canadian Shipowners Association / Lake Carriers Association, International Joint Conference,
St. Petersburg, FL, 2/04

National Association of Conservation Districts, Great Lakes Sediment Loadings Workshop,
Detroit, MI, 3/1-3/04

GLC Semi-Annual Meeting and 2nd Annual Sustainability Conference, Cleveland, OH,
4/26-30/04

Indiana Water Environment Association Meeting, Indianapolis, IN, 5/6-8/04

American Water Resources Association, 2004 Spring Specialty Conference,
GIS and Water Resources III, Nashville, TN, 5/17-19/04 (abstract deadline 10/31/03)

National Water Quality Monitoring Council, Building and Sustaining Successful
Monitoring Programs, Nashville, TN, 5/17-20/04 (abstract deadline 10/31/03)

Air and Waste Management Association - Indianapolis, IN, 6/22-25/04

Water Environment Federation, Watershed 2004, Dearborn, MI, 7/11-13/04

Great Lakes Mayors Conference, Chicago, IL, 7/14-16/04

SOLEC 2004, Toronto, ON 10/5-7/04

Great Lakes Fishery Commission - Lake Committees Meetings - location and date TBD

Region 2, 3, 5 Response Team Meetings - locations and dates TBD

Other Approaches to Acquire Stakeholder Input

Send focused queries to Great Lakes vessel fleet engineers

Engage the IJC Boards and Committees

- International Lake Ontario – St. Lawrence River Study Board
- International Lake Superior Board of Control
- International Niagara River Board of Control
- International St. Lawrence River Board of Control
- International Air Quality Board
- Science Advisory Board
- Water Quality Board

Engage the Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data

Involve any monitoring systems body

Involve any of the following professional associations/bodies:

- American Association of Port Authorities (AAPA)
- American Geophysical Union (AGU)
- American Meteorological Society (AMS)
- American Society of Civil Engineers
- American Society of Limnology and Oceanography (ASLO)
- American Society for Photogrammetry and Remote Sensing (AWRA)
 - Eastern and Western Great Lakes Regions
- American Water Resources Association (AWRA) – National and State Sections
- American Water Works Association (AWWA)
- Association of State Drinking Water Administrators
- Great Lakes Charters Association
- National Marine Manufacturers Association (NMMA)
- Ontario Marine Operators Association (OMOA)
- Ontario Sailing Association (OSA)
- Regional Response Team – Regions 2, 3 and 5
- Society for Conservation Biology (SCB)
- Society of Wetlands Scientists (SWS) – North Central and Mid-Atlantic Chapters
- Spill Control Association of America (SCAA)
- Urban and Regional Information Systems Association (URISA)
- Water Environment Federation (WFE) – Central States Water Environment Association (CSWEA), Illinois Water Environment Association (ILWEA), Indiana Water Environment Association (INWEA), Michigan Water Environment Association (MWEA), New York Water Environment Association (NYWEA), Ohio Water Environment Association (OWEA), Water Environment Association of Ontario (WEAO), Pennsylvania Water Environment Association
- Wisconsin Wastewater Works Operations Conference
- Wisconsin Wetlands Association