

# 2012/2013 ANNUAL MEETING OF THE LAKE MICHIGAN ECOSYSTEM MODELING AND FORECASTING WORKING GROUP - REPORT

## GOALS ACHIEVED

1. Agreed on Operational Principles (available [here](#) on GLOS website)
2. Chair was elected
3. 3 subcommittees were formed
4. A decision was made to invite additional participants to the Working Group and newly formed subcommittees via GLIN and the GLOS website.
5. The Working Group will liaise with the Lake Michigan Monitoring Coordination Council via the Chair and Coordinator.

## NEXT WORKING GROUP MEETING

Conference Call in May/June for progress reports from the newly established subcommittees on their white papers, which will answer the questions asked in the Modeling Matrix columns (matrix is available [here](#) on the GLOS Website).

## MEETING NOTES

The Operational Principles have been reviewed and a New Chair has been elected: David Schwab, University of Michigan Great Lakes Water Center (NOAA Retired).

We discussed Working Group priorities and our work plan moving forward. The consensus was that since we can't decide every action we might take related to a specific resource management issue in advance, we should start by taking productive, constructive steps forward. To that end, subcommittees were formed to draft white papers on three of the Resource Management issues identified in the Modeling Matrix:

- Beach Closings: Dave Schwab
- Fish Stock Assessment: Chuck Madenjian, Bo Bunnell, Ed Rutherford
- Cladophera/Nutrient Management: Hank Vanderploeg, Harvey Bootsma

The questions that will be answered in each white paper are the column headings from the Modeling Matrix:

- Resource Management Issue
- Decision
- Is your current decision support meeting your decision making needs?
- Identified Need
- Spatial Resolution Needed
- Temporal Resolution Needed

- Acceptable levels of Uncertainty
- Is a Model Needed?
- Current Input Parameters
- Output parameters
- Relevant Models
- Life Cycle: Conceptual, Developmental, Existing
- Computational Aspects
- Model Type: Empirical, Deterministic, Mix
- Short-term/ Long-term Hindcasting and/or Forecasting
- Possible Modeling Opportunities
- Contacts/ Reference Material
- Political/ Socio-economic factors

The next step after developing these white papers would be to identify cross-cutting issues and evaluate modeling efforts that would address these particular issues. This would essentially be a description of the state of modeling science.

#### CSMI Presentations

The following presentations, along with other documents mentioned in this summary, are available on the Working Group's Sharefile site for your perusal:

- Lake Michigan Nearshore Strategies: Monitoring, Research, and Modeling - Prof. Harvey Bootsma, University of Wisconsin – Milwaukee
- 2010 Lake MI CSMI Summary Data - Glen Warren, EPA – GLNPO
- 2010 CSMI Results for MI tributaries - John Matousek, MI DEQ
- 2010 Coastal Conditions Report - Mari Nord, EPA – Region 5

**Mari Nord indicated that they welcome any input into the current Coastal Conditions Report and the preparation for the next Coastal Conditions Survey. They are especially seeking any references or recommendations for water quality cut-points. If any Working Group members would like to have a more active role they should contact me at [mdolor@glos.us](mailto:mdolor@glos.us) and I will pass their contact information on to Mari.**

#### Lake Michigan Monitoring Coordination Council

John Hummer provided an overview of the Great Lakes Commission project with the Lake Michigan Monitoring Coordination Council (LMMCC). The title of the project is "Evaluating and Enhancing Lake MI Nearshore Monitoring."

During this project the LMMCC will develop a central database of nearshore monitoring activities since the last intensive year monitoring for Lake Michigan in 2010.

They will conduct a follow-up to the 2009 inventory working with Charlie Peters and his team at USGS. The goal is to complete the inventory this spring and present it at a workshop that will be held this

spring before field season. They will also be working with the Large Aquatic Ecosystem Data Exchange, which is currently focused on contaminated sediment data.

The primary outcome from the project will be a Lake Michigan Nearshore Monitoring Status Report and Assessment – what will be based on the inventory, workshops, and other interim work.

Great Lakes Commission Workshops on monitoring efforts (details are forthcoming):

- Spring 2013
- October 15, 2013 in conjunction with the 2013 Great Lakes Beach Association/State of Lake Michigan Conference: <http://www.glin.net/glba/events.html>

The Working Group determined that it would be worthwhile to have a representative from the Council at Working Group meetings and vice versa. This will help to facilitate coordination between monitoring and modeling activities.

**Working Group members are invited to contact John Hummer (Great Lakes Commission Contractor) if they are interested in contributing to either the NEMO (Nearshore Monitoring) or LMMCC (Lake Michigan Monitoring Coordination Council) work. Please email: [jhummer@glc.org](mailto:jhummer@glc.org)**

#### Recent Changes in the Biogeochemistry Of the Great Lakes System

John Bratton, invited Interested Working Group members to participate in an upcoming workshop focused on assessing recent changes in the biogeochemistry of the Great Lakes system. The workshop will be held March 11-13, 2013 at Wayne State University and details can be found here:

<http://bogls.science.wayne.edu/>

#### Discussion of 2015 Lake Michigan Coordinated Science Monitoring Initiative (CSMI) Planning Input

There was a robust discussion of the Working Group's role in the planning for the upcoming Lake Michigan CSMI in 2015. The discussion started with a history of the Working Group and the fact that it came into existence as a result of the last Lake Michigan CSMI in 2010. The need for an organized group of individuals who remained focused on the lake after the intensive sampling year came to a close was recognized and the first Lake Michigan Modeling Workshop was convened in December 2010.

The guiding questions for the discussion were:

1. What type of framework or timeline can we lay out over the next two years to ensure that sampling is as effective as possible?
2. What milestones can we develop between now, January 2013, and April 2015 (when the field sampling season starts)?
3. What kinds of meetings/workshops should be held? When should they occur? Who should be invited?

Key Points from the discussion are presented below:

- As we plan for 2015 it is important to note that some models will never be used for ecosystem forecasting per se, but can be used to understand how the system works mechanistically.
- We have to continue to get feedback and input from the Stakeholder/Manager Advisory Committee.
- One goal in 2015 is to use the data to validate a nutrient/zooplankton/phytoplankton model.
- Another goal is to steer the sampling program by picking a specific forecast and consider it from a modeling and data standpoint.
- The Working Group will set up a case study for this prediction, develop a sampling strategy, and evolve this into modeling capability.
- People are trying to determine where they have the largest error in the models and while monitoring isn't valued, modeling capability being improved by observations is valued.
- It is important to determine what was in Lake Michigan 15-20 years ago and determine how it has evolved in recent years.
- Specific to CSMI the Working Group could: 1) Pick a few pilot cases or places where we can apply models and see how well they work. 2) For some of the fish stock assessment models we aren't that far along yet, but in 2015 we can collect data to help develop the model despite not being able to use them for forecasting yet.
- The Working Group could help determine what levels of uncertainty are. What did we learn from 2010? We still don't know yet, but we can ask the people who do know.
- A recent comment in Nature "Time to model all life on Earth" discusses the need to develop robust ecological parameters and this is something that modelers have expressed a need for.
- The Working Group fits in extremely well with the Modeling Subsystem of the Great Lakes observing system Enterprise Architecture and this is why it makes sense for GLOS to serve as facilitator/coordinator for the group.
- A suggestion was offered to develop questions to ask the leads on each sampling activity which would lead to the development of a prospectus. Felix Martinez will work with the Secretariat on this suggestion.

**In summary the Working Group is continuing to work towards the two goals laid out at the outset in December 2010:**

- 1. Getting all the experts together and moving towards more global variables.**
- 2. Acting as brokers by working with stakeholders/managers and learning what would be useful for them**

Relevant Paper

[Great Lakes Regional Research Information Network 2012 Lake Michigan Food Web Research Workshop Report](#)

### Upcoming papers and tools

- From USGS: A White Paper Describing a Conceptual Framework for Lake Michigan Nearshore Ecosystem and Relevance to Lake Michigan Lakewide Management Plan Goals
- The Great Lakes National Coastal Conditions Assessment
- USGS Great Lakes Science Mapper