



# Great Lakes Environmental Research Laboratory

*Leader in ecosystem research in the Great Lakes and beyond*

## What does the Great Lakes Environmental Research Laboratory do for the Nation?

The Great Lakes Environmental Research Laboratory (GLERL) was formed in 1974 to provide a focus for NOAA's ecosystem research in the Great Lakes. GLERL develops ecosystem forecasts to predict the effects of biological, chemical, physical, and human-induced changes on ecosystems. GLERL's research and scientific leadership on important issues in both Great Lakes and marine coastal environments leads to new knowledge, tools, approaches, awareness, and services.



Western and Central Lake Erie Harmful Algal Bloom (photo: NOAA CoastWatch – Great Lakes Region MODIS image)

## Recent Accomplishments:

### First ever Lake Erie Harmful Algal Bloom Bulletin issued.

- GLERL research continues to characterize Great Lakes harmful algal bloom dynamics. Harmful Algal Blooms (HABs) occur when algae produce toxins that are harmful to people, fish, shellfish, marine mammals and birds, and are triggered by excessive nutrient levels or sunlight in water. This year GLERL, working in conjunction with the NOAA Center of Excellence for Great Lakes and Human Health and university partners, produced the first-ever Lake Erie Harmful Algal Bloom Bulletin which distributed warning information throughout the Lake Erie watershed. **Payoffs: The ability to predict HABs and issue early warnings will aid in reducing human health risks associated with rapid degradation in drinking water quality and Great Lakes beach conditions.**

## GLERL co-hosted a workshop – *Impact of Climate Change on the Great Lakes Ecosystem – A NOAA Science Needs Assessment to Meet Emerging Challenges July 2008.*

- The overarching purpose of the workshop was to develop a NOAA research strategy to address climate change impacts on Great Lakes coastal ecosystems as driven by user needs. Workshop co-hosts included: the NOAA/University of Michigan Cooperative Institute for Limnology and Ecosystems Research (CILER), the Great Lakes Sea Grant Network, and the NOAA Great Lakes Regional Collaboration Team. **Payoffs: The workshop report identifies and prioritizes research needs and future plans toward understanding climate change impacts on physical, chemical, and biological processes in Great Lakes coastal waters and connecting channels.**

## New Research Initiative: GLERL is studying the relationship between climate patterns and the Great Lakes' ice cover.

- GLERL is conducting statistical data analysis of both ice data and atmospheric data in all five Great Lakes, including in situ observations and satellite measurements. **Payoffs: Knowledge of lake ice behavior in the Great Lakes associated with climate patterns is important not only to winter navigation and rescue efforts, but also to prediction of precipitation, lake water level variability, and environmental conditions for algal blooms.**



Ice Core Sampling, Green Bay, Lake Michigan (photo: NOAA)

## What's next for GLERL?

**Expansion of Ecosystem Forecasting Capabilities** – In an effort to design and create reliable and accurate ecological forecasting capabilities, GLERL has consolidated its research activities into four components:

- **Physical Environmental Prediction** – nearshore and open-lake hydrodynamics, water resources research, climate change and variability, and research into infrequent but significant events ;
- **Ecological Prediction** – foodweb dynamics, long-term examination of specific foodweb components or habitat, understanding and predicting causes, effects, and solutions to problems such as eutrophication (abundant nutrients supporting excessive algae growth), toxic contaminants, invasive species and human-caused habitat modification;
- **Aquatic Invasive Species** - prevention of aquatic invasive species introduction, evaluating ecological impacts of aquatic invasive species; and reporting the monitoring the status of aquatic invasions in the Great Lakes;
- **Great Lakes Observing System** – long-term monitoring and assessment of lake health, Great Lakes CoastWatch, and the Integrated Great Lakes Coastal Observing System.



Portable Real-time Coastal Observation Network (ReCON) buoy. (photo: NOAA)

### Research Partnerships:

GLERL conducts collaborative research with over 150 research institutions at the state, regional, national, and international levels. GLERL also conducts research with the Cooperative Institute for Limnology and Ecosystems Research (CILER) (a 10-member University consortium) and academic institutions throughout the Great Lakes region.

### Budget and Staff

The fiscal year 2008 enacted budget for the GLERL totaled \$9.0M. The fiscal year 2009 President's budget request for GLERL is \$9.3M. GLERL currently supports 57 permanent full time Federal employees.

#### Did You Know?

In January 2009 GLERL moved into a new facility located approximately four miles from the center of town, at 4840 South State Road, Ann Arbor, MI. The 40,225 square foot facility contains state-of-the-art wet and dry laboratories, conference facilities, a library, a marine instrumentation shop and a host of offices to accommodate over 100 federal and cooperative institute employees. This facility not only accommodates research space but also provides a forum to foster collaboration throughout the Great Lakes community.



New building dedication ceremony held on January 9, 2009. (image: NOAA)



[www.glerl.noaa.gov](http://www.glerl.noaa.gov)



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