Strengthening Great Lakes Monitoring and Assessment

Legislative Guidance

July 2006

Great Lakes Monitoring Inventory Identifies Gaps and Recommends Improvements to Great Lakes Monitoring Programs

OVERVIEW

In September 2004 the Government Accountability Office (GAO) issued a report, *Great Lakes Organizational Leadership and Restoration Goals Need to be Better Defined for Monitoring Restoration Progress* (GAO-04-1024), that identified coordination of restoration goals and monitoring activities as a key challenge facing Great Lakes leaders. The report singled out the lack of a centralized repository of information on monitoring activities as a key gap in the overall Great Lakes management structure. Responding to this critical unmet need, the Great Lakes Commission (Commission) developed a centralized repository of Great Lakes monitoring information. The *Great Lakes Monitoring Inventory and Gap Analysis*, funded through a grant from the Joyce Foundation, is the first comprehensive binational inventory of monitoring programs in the Great Lakes basin.

Using the inventory and input from U.S. and Canadian monitoring experts, Commission staff assessed the capacity of regional monitoring efforts to respond to established monitoring needs. The assessment was based on a suite of indicators of Great Lakes health established by the U.S. and Canadian governments operating under the auspices of the Great Lakes Water Quality Agreement through the binational State of the Lakes Ecosystem Conference (SOLEC) process.

LEGISLATION AND APPROPRIATIONS RECOMMENDATIONS FOR GREAT LAKES MONITORING

To advise Congressional decision makers of the status of Great Lakes monitoring efforts, Commission staff have developed a suite of legislative recommendations that address major gaps highlighted in the *Great Lakes Monitoring Inventory and Gap Analysis* report. Some needs may be best addressed directly by monitoring agencies under current authorities and funding levels. The intent of these recommendations is to provide guidance to legislators and policymakers as they consider policy changes and new legislation to address these gaps and improve the overall Great Lakes monitoring regime. The recommendations are meant to complement and inform ongoing legislative efforts directed at Great Lakes management; they represent the analysis of Commission staff rather than the consensus views of the Commission's member states and provinces.

In the following sections, monitoring gaps and legislative recommendations are presented across the thirteen categories listed below. Each monitoring gap is presented along with potential legislative actions and relevant authorizations and potentially responsible agencies.

- General Monitoring Coordination
- Water Quality
- Drinking Water
- Groundwater
- Wetlands
- Sediment Quality
- Aquatic Invasive Species
- Ambient Air Quality
- Atmospheric Deposition
- Soil Quality
- Erosion
- Habitat and Land Use

The *Great Lakes Monitoring Inventory and Gap Analysis* and associated recommendations provide building blocks for strengthening regional observing and monitoring systems. Efforts are ongoing to integrate the inventory and gap analysis into larger Great Lakes monitoring coordination initiatives, including the Great Lakes Observing System (GLOS), an integrated observing system being developed to provide critical real-time data to the region on Great Lakes conditions. This system will serve as a regional node of the National Oceanic & Atmospheric Administration's (NOAA) National Integrated Ocean Observing System (IOOS), which supports research on populations, species, communities, and ecosystems. Complete findings from the *Great Lakes Monitoring Inventory and Gap Analysis* are being disseminated to the monitoring community, resource managers, and federal and state legislators in the Great Lakes region. More detailed information on the recommendations and additional information can be found in the complete report, available online at http://www.glc.org/monitoring/greatlakes/.

RECOMMENDATIONS TO IMPROVE GREAT LAKES MONITORING

General Monitoring Coordination

- Form regional coordinating bodies to organize monitoring efforts in key issue areas. Coordinating bodies are a necessary element for effective management of regional monitoring efforts. A highly successful example of such a partnership is the *Joint Strategic Plan for Management of Great Lakes Fisheries*, supported by 14 federal, tribal, state and provincial organizations, that addresses shared fishery resources under the auspices of the Great Lakes Fishery Commission. This framework is a strong example of effective coordination and collaboration and provides a useful model for other areas of Great Lakes monitoring.

  Recommended Legislative Actions: *Support U.S. Environmental Protection Agency (U.S. EPA) efforts to coordinate program activities; implement a comprehensive communication plan to support the Great Lakes Regional Collaboration Strategy; and develop specific issue-based monitoring coordinating bodies.*
  Relevant Authorizations: *Great Lakes Water Quality Indicators and Monitoring Act (S. 208IS, 109th Congress); Great Lakes Controlled Data Collection Monitoring Act (H.R. 718IH, 109th Congress)*
  Responsible Agency: *U.S. EPA (FY2006 H.Rept. 109-188)*

- Federal and state monitoring mandates should respond more directly to regional monitoring needs. Regional offices of federal agencies need to encourage program administrators to allow greater discretion and flexibility to address regional monitoring needs. Similarly, state, provincial, local and nongovernmental programs need flexibility to evolve over time to address regional information needs. Without this flexibility, data generated by more narrowly defined monitoring programs may not be useable in a regional context, resulting in monitoring inefficiencies or ineffectiveness.

  Recommended Legislative Actions: *As national monitoring programs are reauthorized or otherwise amended, revise authorizing language to allow for regional (i.e. multi-state) monitoring designs that focus on ecosystem boundaries rather than political boundaries.*
  Relevant Authorizations: *No specific targeted legislation*
  Responsible Agency: *All agencies administering monitoring programs*

- Evaluate monitoring needs, costs, and current regulations prior to establishing funding levels. Funding levels should be based on resources needed to meet previously set monitoring objectives and regulatory requirements. Funding levels also need to account for changing monitoring costs.

  Recommended Legislative Actions: *Consider monitoring requirements and current costs when establishing funding levels. Ensure that the cost of monitoring for program success is accounted for when appropriating for managing programs.*
  Relevant Authorizations: *Future authorizations and appropriations budgets*
  Responsible Agency: *All agencies administering monitoring programs*

Water Quality

- There is limited data on toxic chemical concentrations in offshore waters of the Great Lakes. It is important to note that toxic chemical concentrations are also measured via indirect methods, such as in sediments and fish tissue. More investigation is needed to determine if the benefits of monitoring the toxic chemical concentrations in water is worth the added expense when similar data are being collected in sediments and fish.

  Recommended Legislative Actions: *The federal government should continue to support the Great Lakes Binational Toxics Strategy and should evaluate its implementation strategy to ensure adequate monitoring of toxic chemical concentrations in offshore waters of the Great Lakes.*
  Relevant Authorizations: *Water Quality Act 1987 (Pub. L. 100-4; 33 USC 1251 et seq)*
  Responsible Agency: *U.S. EPA (FY2006 H.Rept. 109-188)*

Drinking Water

- The Great Lakes basin would benefit from the development of a targeted program to monitor high-risk private, single-family, well-water systems. Most states and provinces test well water when installing wells, but subsequent testing of wells is not generally conducted for single family users -- even in high-risk areas.

  Recommended Legislative Actions: *Develop a targeted program to monitor high-risk private, single-family, well-water systems as part of the National Drinking Water Regulations. Also, additional support may be needed to incorporate results into U.S. EPA's Safe Drinking Water Information System.*
  Relevant Authorizations: *Safe Drinking Water Act Amendments 1996 (Pub. L. 104-182; 42 USC 300f et seq)*
  Responsible Agency: *U.S. EPA (FY2006 H.Rept. 109-188)*

- More resources need to be directed at monitoring surface drinking water sources to get an accurate understanding of the health of the ecosystem. Most drinking water monitoring is directed at evaluating treated drinking water systems. Evaluation of surface drinking water sources requires monitoring for smaller concentrations of contaminants than general water quality monitoring. Due to the high cost of this type of monitoring, few resources are available for monitoring surface water sources.

  Recommended Legislative Actions: *Increase monitoring of drinking water sources by providing additional resources to U.S. EPA through the Safe Drinking Water Act or the Clean Water Act.*
  Relevant Authorizations: *Safe Drinking Water Act Amendments 1996 (Pub. L. 104-182; 42 USC 300f et seq); Water Quality Act 1987 (Pub. L. 100-4; 33 USC 1251 et seq)*
  Responsible Agency: *U.S. EPA (FY2006 H.Rept. 109-188)*

Groundwater

- More resources need to be directed toward monitoring groundwater discharges in the region. No specific groundwater discharge monitoring programs were reported to the inventory. A long-term evaluation of direct groundwater discharge to the Great Lakes is necessary to develop baseline data needed to understand hydrologic processes.

  Recommended Legislative Actions: *Provide resources necessary to expand current U.S. Geological Survey (USGS) activities to include a comprehensive, regional groundwater discharge monitoring program.*
  Relevant Authorizations: *USGS Organic Act 1879, as amended (Pub. L. 87-626; 43 USC 31 et seq)*
  Responsible Agency: *USGS (FY2006 H.Rept. 109-188)*

- Maintain funding for the USGS gauging station program. The USGS gauging station program monitors surface water, groundwater, and water quality extensively across the U.S. portion of the basin. Funding for many of these sampling locations comes from sources outside of USGS, such as state agencies and universities. Due to federal, state, and nongovernmental budget cuts, funding for this important program is threatened.

  Recommended Legislative Actions: *Appropriate additional funds to USGS for Great Lakes gauging programs and increase the federal cost share to reverse losses to the network, establish new gauging stations in areas of concern, and improve sediment monitoring at key stations.*

Relevant Authorizations: *USGS Organic Act 1879, as amended (Pub. L. 87-626; 43 USC 31 et seq)*
Responsible Agency: *USGS (FY2006 H.Rept. 109-188)*

Wetlands

- A program is needed to regularly update wetland boundaries. A comprehensive inventory of coastal wetlands has been completed under the Great Lakes Coastal Wetlands Consortium initiative, and landscape level changes can be computed at a coarse scale, but there are currently no programs to regularly update this inventory.

  Recommended Legislative Actions: *Provide sufficient resources to allow for regular (every five years) collection of satellite or airborne imagery with sufficient resolution to delineate wetland boundaries and identify dominant vegetation. Funding should be sufficient to allow complete analysis of remote data.*
  Relevant Authorizations: *Coastal Zone Management Act of 1972 (Pub. L. 102-567; 33 USC 2801 et seq) or Water Resources Development Act, Title IV (H.R. 2864; S. 728) or Great Lakes Fish and Wildlife Restoration Act (H.R. 4953; S. 2430)*
  Responsible Agency: *NOAA (FY2006 H.Rept. 109-272), U.S. Army Corps of Engineers (FY2006 H.Rept. 109-188), or U.S. FWS (FY2006 H.Rept. 109-188).*

- No programs appear to be tracking the success of wetland restoration efforts in the Great Lakes basin.

  Recommended Legislative Actions: *Support a partnership program to monitor wetland status and success of restoration through the Great Lakes Coastal Wetlands Consortium. Direct the partnership to coordinate priorities for funding restoration projects from the Great Lakes Watershed Restoration Program, administered by the National Fish and Wildlife Foundation (NFWF).*
  Relevant Authorizations: *New legislation or via existing authorizations to partner organizations, with authorization for Consortium funding through Water Quality Act 1987 (Pub. L. 100-4; 33 USC 1251 et seq).*
  Responsible Agencies: *NFWF(FY2006 H.Rept. 109-188); U.S. EPA (FY2006 H.Rept. 109-188); NOAA (FY2006 H.Rept. 109-272); U.S. FWS (FY2006 H.Rept. 109-188); USDA (FY2006 H.Rept. 109-255)*

- Wetland ecosystem health is seen as a high priority in the region, but additional resources are needed to reach short and long-term goals set forth by the *Great Lakes Regional Collaboration Strategy*. In addition, implementation of state wetland monitoring plans called for by U.S. EPA's Office of Wetlands, Oceans, and Watersheds may require additional resources.

  Recommended Legislative Actions: *Provide sufficient resources to Great Lakes state agencies to allow each to establish a wetlands monitoring program. Monitoring should be coordinated through the Great Lakes Coastal Wetlands Consortium or similar coordinative body to ensure data comparability.*
  Relevant Authorizations: *Funding should be enhanced under authority of Water Quality Act 1987 Sections 106 & 118 (Pub. L. 100-4; 33 USC 1251 et seq)*
  Responsible Agency: *U.S. EPA (FY2006 H.Rept. 109-188)*

Sediment Quality

- The monitoring inventory indicates that while there is a considerable amount of issue-driven sediment sampling, more baseline sediment monitoring is needed. Currently there is little guidance on baseline sampling for open waters and nearshore areas of the basin. To successfully address SOLEC indicators, specific monitoring guidelines need to be developed in this area.

  Recommended Legislative Actions: *Establish a long-term sediment monitoring program targeted at collecting baseline data for the entire Great Lakes basin.*
  Relevant Authorizations: *USGS Organic Act 1879, as amended (Pub. L. 87-626; 43 USC 31 et seq); Water Quality Act 1987 (Pub. L. 100-4; 33 USC 1251 et seq)*
  Responsible Agency: *USGS (FY2006 H.Rept. 109-188); U.S. EPA (FY2006 H.Rept. 109-188)*

Aquatic Invasive Species

- Form a regional coordinating body to organize and record aquatic invasive species (AIS) monitoring and management activities. A binational AIS monitoring office is needed to serve as a central location for coordinating monitoring activities and serve as a central resource for AIS related monitoring data.

  Recommended Legislative Actions: *Reauthorize the National Aquatic Invasive Species Act (NAISA) and amend it to include authorization needed to create an AIS monitoring coordination body.*

  Relevant Authorizations: *National Aquatic Invasive Species Act (NAISA) (Pub. L. 101-646; 16 USC 4701 et seq)*

  Responsible Agency: *U.S. Fish and Wildlife Service (U.S. FWS) (FY2006 H.Rept. 109-188), NOAA (FY2006 H.Rept. 109-272)*

- The region would benefit from development of a scientifically-based aquatic invasive species (AIS) early detection monitoring program. An early detection monitoring strategy should be coupled closely with a rapid response program. This type of monitoring program, which would enable regional managers to effectively and efficiently detect invasions, is important when considering the limited funds currently available.

  Recommended Legislative Actions: *Reauthorize NAISA and fully fund support for rapid response strategies.*

  Relevant Authorizations: *National Aquatic Invasive Species Act (NAISA) (Pub. L. 101-646; 16 USC 4701 et seq)*

  Responsible Agency: *U.S. FWS (FY2006 H.Rept. 109-188); NOAA (FY2006 H.Rept. 109-272)*

Ambient Air Quality

- Funding for state-run ambient air monitoring programs must be maintained to meet U.S. national standards. There are concerns about possible network reductions due to budget cuts to ambient air monitoring programs. Concurrently, there are discussions about implementing new U.S. national standards that may require more stringent monitoring efforts. With current levels of funding, it may not be possible to maintain an effective network of ambient air monitoring stations necessary to meet national standards. In addition, there is a need to invest resources for the development of monitoring technology.

  Recommended Legislative Actions: *Provide sufficient resources to U.S. EPA under the Clean Air Act to support state efforts to address deposition of mercury and other priority persistent toxic substances to the Great Lakes by tracking emissions, atmospheric transport, deposition, and exposure.*

  Relevant Authorizations: *Clean Air Act Amendments of 1990 (Pub. L. 101-549, Title III, 112(m); 42 USC 7401, 7402, 7403(c), 7412(m))*

  Responsible Agency: *U.S. EPA (FY2006 H.Rept. 109-188)*

Atmospheric Deposition

- The spatial distribution of atmospheric deposition sampling locations should be evaluated. Atmospheric monitoring of dioxin and mercury is particularly costly, so more research should be conducted to determine the appropriate spatial distribution of atmospheric deposition sampling locations.

  Recommended Legislative Actions: *Provide sufficient resources to U.S. EPA to monitor concentrations, trends and loadings of toxic substance to the Great Lakes from the atmosphere under the Integrated Atmospheric Deposition Network (IADN) in support of Annex 15 of the Great Lakes Water Quality Agreement.*

  Relevant Authorizations: *Clean Air Act Amendments of 1990 (Pub. L. 101-549, Title III, 112(m); 42 USC 7401, 7402, 7403(c), 7412(m)); Great Lakes Water Quality Agreement, Annex 15 (approved under the Clean Water Act 1987 (Pub. L. 100-4; 33 USC 1268))*

  Responsible Agency: *U.S. EPA (FY2006 H.Rept. 109-188)*

Soil Quality

- The Soil Climate Analysis Network (SCAN) should address the need for additional sampling locations. The U.S. Department of Agriculture (USDA) National Resources Conservation Service manages SCAN, the only U.S. basinwide program collecting real-time soil moisture and temperature data in the Great Lakes basin.

  Recommended Legislative Actions: *Provide sufficient resources to the Soil Climate Analysis Network (SCAN).*

  Relevant Authorizations: *Soil Surveys for Resources Planning and Development Act 1966 (Pub. L. 89-560; 42 USC 3271 et seq), Natural Resources Conservation Service (Pub. L. 107-171; 7 USC 6962)*

  Responsible Agency: *U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (FY2006 H.Rept. 109-255)*

Erosion

- A comprehensive, regional approach to coastal erosion monitoring is needed. Pennsylvania's Bluff Recession Monitoring project and Ohio's Lake Erie Coastal Erosion Study are valuable examples of coastal erosion monitoring. Implementing similar programs in the other Great Lakes states and provinces would provide a valuable, basinwide perspective on this issue, which can be particularly important during periods of high water levels when coastal erosion can threaten public safety and cause serious economic damage in coastal areas.

  Recommended Legislative Actions: *Provide support for the implementation of coastal erosion monitoring programs throughout the Great Lakes basin.*

  Relevant Authorizations: *Investigations concerning erosion of shores of coastal and lake waters (Pub. L. 86-645; 33 USC 426-426p)*

  Responsible Agency: *USACE (FY2006 H.Rept. 109-275)*

Habitat and Land Use

- Update current land use and habitat classification maps. Updated, high resolution maps are needed to advance habitat monitoring capabilities, accurately track gains and losses in different types of high-value habitat, and focus and coordinate conservation efforts.

  Recommended Legislative Actions: *Provide adequate support for current land cover mapping programs including the USGS National Land Cover Characterization Project and NOAA's Coastal Change Analysis Program.*

  Relevant Authorizations: *USGS Organic Act 1879, as amended (Pub. L. 87-626; 43 USC 31 et seq); Coastal Zone Management Act of 1972 (Pub. L. 102-567; 33 USC 2801 et seq)*

  Responsible Agency: *NOAA (FY2006 H.Rept. 109-272), USGS (FY2006 H.Rept. 109-188)*

CONCLUSION

The *Great Lakes Monitoring Inventory and Gap Analysis* and associated recommendations provide building blocks for strengthening regional observing and monitoring systems, as recommended in the *Great Lakes Regional Collaboration Strategy*, released in December 2005. In the long term, coordination with initiatives such as the Great Lakes Observing System (GLOS) will further enhance data coordination and collaboration efforts. The project's findings and recommendations are being disseminated to the monitoring community, resource managers, and federal and state legislators in the Great Lakes region.

This advisory document represents a summary of potential legislative actions for addressing gaps in Great Lakes monitoring. The complete report contains numerous other recommendations for local, state and federal agencies, as well as actions by nongovernmental entities. Please refer to the full report at www.glc.org/monitoring/greatlakes for a more complete analysis of monitoring in the Great Lakes basin. Questions may also be directed to Matt Doss, Great Lakes Commission, mdoss@glc.org, 734-971-9135.

PROJECT BACKGROUND:
Great Lakes Monitoring Inventory and Gap Analysis

In September 2004 the Government Accountability Office (GAO) released a report: *Great Lakes Organizational Leadership and Restoration Goals Need to be Better Defined for Monitoring Restoration Progress* (GAO-04-1024), that identified coordination of existing restoration goals and monitoring activities as a key challenge facing Great Lakes leaders. More specifically, the report identified the lack of a centralized repository of information on monitoring activities as a key gap in the overall Great Lakes management structure. Without such information, the GAO concluded that it is difficult to coordinate existing data and determine the additional information needed to establish baseline conditions and assess progress toward achieving restoration goals.

Recognizing this critical unmet need, the Great Lakes Commission developed a centralized repository of Great Lakes monitoring information. Funded through a grant from the Joyce Foundation, the *Great Lakes Monitoring Inventory and Gap Analysis* is the first comprehensive binational inventory of monitoring programs in the Great Lakes basin. It includes descriptive information on more than 600 U.S. and Canadian monitoring programs that assess various components of the Great Lakes' environmental health.

Using the inventory and input from U.S. and Canadian monitoring experts, Commission staff assessed the capacity of the regional monitoring regime to respond to established monitoring needs. During this process the monitoring inventory was evaluated based on a suite of indicators of Great Lakes health previously defined by the U.S. and Canadian governments under the State of the Lakes Ecosystem Conference (SOLEC) process. Gaps, overlaps and opportunities for improved regional cooperation were distilled into 41 specific recommendations in 21 topical areas.