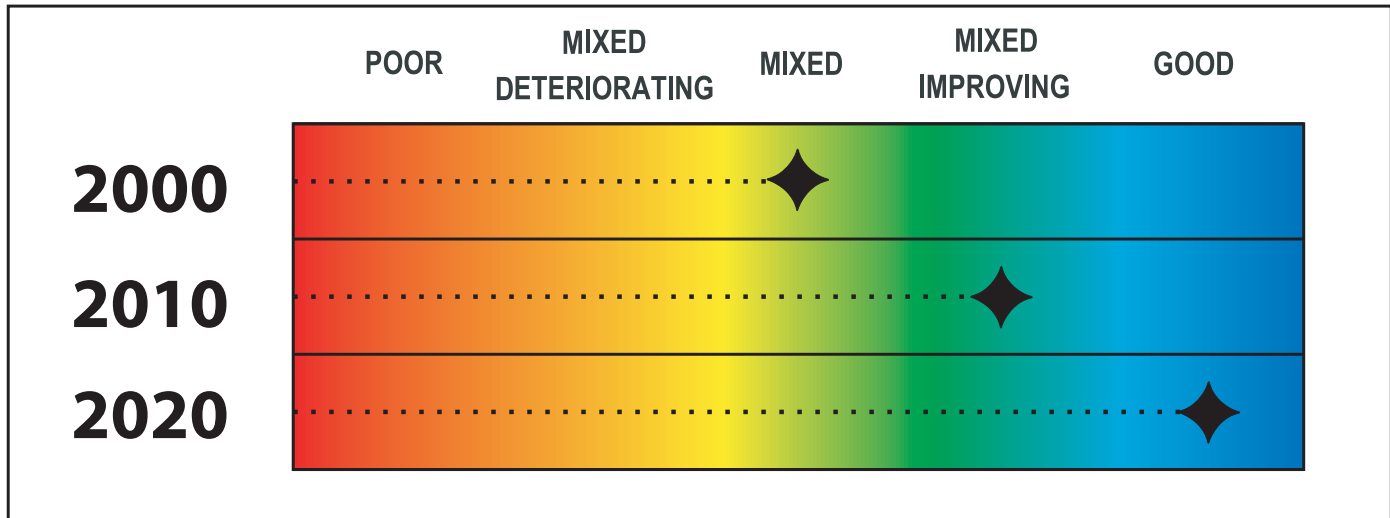




## Subgoal 10

### Is collaborative ecosystem management the basis for decision-making in the Lake Michigan basin?



#### Status

The LaMP provides a lake-level framework serving both as a reference document and a proposal for a process to remediate past errors and achieve a sustainable Lake Michigan basin ecosystem. To this end, every effort has been made to ensure that the Lake Michigan LaMP and updates contain clear, comprehensive goals, specific objectives, a strategic plan, and a system of indicators and monitoring to judge the environmental status and effectiveness of current actions.

Collaboration among a variety of stakeholders to improve the Lake Michigan ecosystem has increased since LaMP 2000. This section documents several of these collaborative activities, including:

- The Great Lakes Strategy ([www.epa.gov/glnpo/gls/index/html](http://www.epa.gov/glnpo/gls/index/html))
- Activities of the Binational Executive Committee
- Great Lakes Binational Toxics Strategy ([www.epa.gov/glnpo/p2/busintro.html](http://www.epa.gov/glnpo/p2/busintro.html))
- The Great Lakes Human Health Network
- Activities of the Great Lakes Fishery Commission ([www.glfc.gov](http://www.glfc.gov))
- A shared goals project involving EPA Region 5 and state water quality programs

- A buffer protection strategy
- The 2002 Wingspread Accord

Other collaborative activities, such as a proposed mercury phase-out, are discussed in other sections of this document.

#### Challenge

- To develop clear goals and objectives that facilitate coordinated actions among agencies and stakeholders.



Empire Bluff at Sleeping Bear Dunes National Lakeshore, Empire, Michigan

Photography courtesy of Michigan Travel Bureau\*



## Great Lakes Strategy

Great Lakes Strategy 2002 was created by the U.S. Policy Committee – a forum of senior-level representatives of federal, state, and tribal agencies responsible for environmental and natural resource management of the Great Lakes – to help coordinate and streamline the efforts of the many governmental partners involved in protecting the Great Lakes. The strategy focuses on multi-lake and basinwide environmental issues and establishes common goals that the governmental partners work toward. It supports efforts already underway, including LaMPs and RAPs for AOCs, by addressing issues that are beyond the scope of these programs and helping to integrate them into an overall, basinwide context. The strategy also advances the implementation of the United States' responsibilities under the 1987 GLWQA.

The strategy is a concise, policy level statement of basinwide priorities and activities that address the current state of the Great Lakes basin ecosystem and key environmental goals for the future so that a unified approach to implementation can be carried out by a diverse set of federal, state, and tribal agencies. The long-term vision of the strategy can be simply expressed as follows:

- All Great Lakes beaches are open for swimming all the time.
- All Great Lakes fish are safe to eat all the time.
- The Great Lakes are maintained and enhanced as a safe source of drinking water.
- The Great Lakes basin is a healthy natural environment for wildlife and people.

## The Binational Executive Committee

The Binational Executive Committee (BEC) is charged with coordinating the implementation of the binational aspects of the 1987 GLWQA. The BEC is co-chaired by Environment Canada and U.S. EPA, and includes members of the Great Lakes states, the Province of Ontario, and other federal departments and agencies in Canada and the United States. The BEC addresses binational, basinwide issues of concern and provides strategic direction to the LaMPs, RAPs, and other Great Lakes programs

such as the Binational Toxics Strategy, and the State of the Lakes Ecosystem Conference.

## Great Lakes Binational Toxics Strategy

The Canada-United States strategy for the virtual elimination of persistent toxic substances in the Great Lakes basin, known as the Great Lakes Binational Toxics Strategy (GLBTS), provides a framework for actions to reduce or eliminate persistent toxic substances, especially those which bioaccumulate. The strategy was jointly developed by Canada and the United States in 1996 and 1997, and it was signed by the two governments on April 7, 1997.

The GLBTS establishes reduction challenges for an initial list of persistent toxic substances targeted for virtual elimination: aldrin/dieldrin, benzo(a)pyrene, chlordane, DDT, hexachlorobenzene, alkyl-lead, mercury and compounds, mirex, octachlorostyrene, PCBs, dioxins and furans, and toxaphene. These substances have been associated with widespread, long-term, adverse effects on wildlife in the Great Lakes and through their bioaccumulation, pose threats to human health. The strategy marked the first time that specific reduction targets were set jointly by the two countries.

Recognizing that virtual elimination is a long-term process, the GLBTS provides the framework for actions to achieve reductions for specific toxic substances in the 1997 to 2006 timeframe. Flexibility is provided in the GLBTS to allow for revision of challenges, timeframes, and the list of targeted substances. The development of baseline measurements for tracking and measuring progress toward reductions is a key element. A "Technical Support Document" appended to the GLBTS provides action items that will be undertaken to pursue reductions ([www.epa.gov/glnpo/p2/bnsintro.html](http://www.epa.gov/glnpo/p2/bnsintro.html)).

## Great Lakes Human Health Network

A Great Lakes-wide human health network is being formed to maximize resources and efficiencies of scale. The U.S. EPA's GLNPO will provide staff resources for a year (2002-2003) as a pilot program. The human health network will bring together experts from throughout the basin to share



information and provide technical assistance on human health issues. The network will be holding initial meetings to discuss terms of reference, its mission, and other details. In the interim, preliminary work on human health issues has begun, including the holding of a Great Lakes Beach Conference.

### **The Great Lakes Fishery Commission**

The Great Lakes Fishery Commission (GLFC) is a critical partner in achieving a balanced and healthy fish community in Lake Michigan, both in terms of controlling exotic species and rehabilitating native species in the lake. GLFC has adopted and implemented an integrated management of sea lamprey (IMSL) approach to control sea lamprey in the Great Lakes. The IMSL process involves using a variety of control methods instead of relying solely on chemicals. For example,

- GLFC is reducing the minimum lethal concentrations of chemicals used to kill larval sea lampreys in order to protect young lake sturgeon and is scheduling chemical treatments later in the summer to reduce the effects on young lake sturgeon. GLFC has reduced chemical use by 50 percent compared to the amounts used in the 1990s.
- GLFC is also using sterile-male releases to impede the reproductive success of sea lampreys, conducting mark-and-recapture studies with juvenile and adult sea lampreys to measure population trends, and researching other strategies to reduce populations of sea lampreys without harming other parts of the ecosystem.
- GLFC technical committees have also developed lakewide lake trout population models that estimate total allowable catches of lake trout, evaluate various fishery management strategies, and estimate damage by sea lampreys to lake trout populations.

Despite the great progress made, sea lampreys continue to kill many fish each year, threatening the restoration of lake trout to Lake Michigan. The principal challenge in controlling the sea lamprey and other exotic species in the lake lies in balancing the use of effective control measures for exotic

species with preservation and restoration of native species.

### **EPA Region 5 Shared Water Program Goals**

The EPA Region 5 Office of Water is collaborating with state and tribal partners to protect and enhance water quality throughout the area. On December 11, 2001, IEPA, IDEM, the Minnesota Pollution Control Agency, WDNR, EPA Region 5, and the EPA Great Lakes National Program Office (GLNPO) all signed a Joint Commitment to Achieve Shared Water Goals. The shared water goals are as follows:

- Goal 1: All waters in Region 5 will support healthy aquatic biological communities.
- Goal 2: All waters in Region 5 will support fish populations with safe levels of contaminants.
- Goal 3: Designated swimming waters in Region 5 will be swimmable.
- Goal 4: All people in Region 5 served by public water supplies will have water that is consistently safe to drink.
- Goal 5: The quantity and quality of critical aquatic habitat in Region 5, including wetlands, will be maintained or improved.

### **A Great Lakes Tributary Riparian Buffer Protection Strategy**

A team evaluating a Great Lakes Tributary Riparian Buffer Protection Strategy is assessing options for an integrated, interagency, tributary protection strategy and developing associated recommendations for the U.S. Policy Committee. The recommendations should include identification of indicators or performance measures that would be used as targets and subsequently monitored to assess the effectiveness of the strategy.

Systemic protection efforts for riparian areas would provide multiple ecological benefits for the Great Lakes basin ecosystem. Terrestrial habitat protection, travel and migration corridor preservation, stream bank stabilization, hydrologic flux moderation, reductions in pollutant loads and impacts, and streambed stabilization are all potential benefits of comprehensive riparian





**An impaired stream before bank restoration and installation of stream buffers**  
Photography courtesy of the Brown County Land Conservation Department,  
Green Bay, Wisconsin

buffer restoration and protection efforts. The implementation challenge that must be overcome to realize these benefits is multiple agency and program coordination and integration. Many jurisdictions have incentive programs for landowners in the riparian zones. A major question is how jurisdictional differences can be effectively blended into a comprehensive effort by eliminating data gaps, duplication of effort, and conflicts. An equally important question is to what degree this integration can occur without compromising the initial legislative intent of the many program authorities.

The Farm Service Agency (FSA) administers the current program with technical assistance from the Natural Resources Conservation Service (NRCS). Under the program, agricultural lands are converted into protected buffer strips or filter strips as a means of reducing water runoff, reducing sedimentation, improving water quality, and providing food and habitat for wildlife. This program offers cash incentives for enrollment, annual payments during enrollment based on local land rental rates, maintenance payments, and bonus cost sharing for restoration practices. There is a national goal to enroll 2 million miles of protected riparian buffers.

### **The 2002 Wingspread Regional Accord**

The Chicago Area Transportation Study, the Northwest Indiana Regional Planning

Commission, the Northeast Illinois Planning Commission, and the Southeastern Wisconsin Regional Planning Commission signed the Wingspread Regional Accord in 2002. The Accord acknowledges that the southern Lake Michigan tri-state region is characterized by socio-economic and environmental interdependence, as evidenced through shared water resources and ecosystems, interconnected transportation systems, and connected employment and residential patterns.

### **Next Steps**

Over the next 2 years, the LaMP will support the following activities to increase collaborative activities:

- Convene a bi-state St Joseph Watershed conference on June 10 and 11, 2002
- Establish the Lake Michigan Watershed Academy
- Hold a 2003 State of Lake Michigan conference
- Take comments on proposed changes to Lake Michigan pollutant and stressor lists



**Stream banks restored and stream buffers installed to prevent farm animals from impairing the stream**

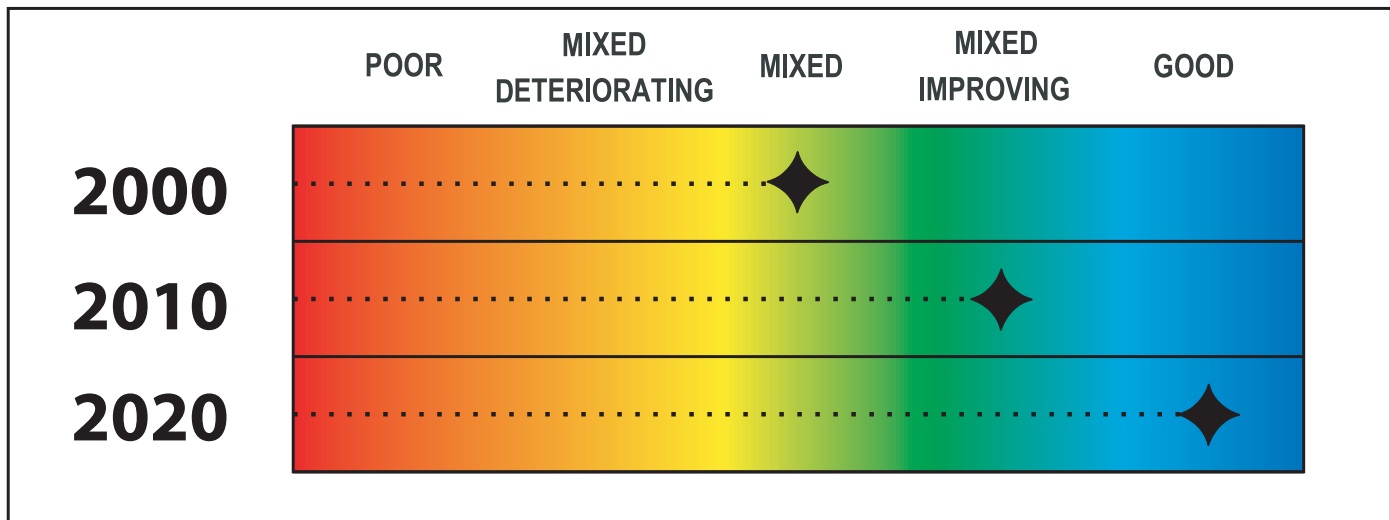
Photography courtesy of the Brown County Land Conservation Department,  
Green Bay, Wisconsin





## Subgoal 11

**Do we have enough information, data, understanding, and indicators to inform the decision-making process?**



### Status

Some information sources are available to support Lake Michigan decision-makers, but more data and indicators are needed to address complex management issues. Numerous monitoring programs and activities are currently underway in the Lake Michigan basin at the federal, state, county, municipal, and watershed levels. These programs monitor water quality, sediments, fish, air quality, and habitat. They involve collecting chemical, microbiological, fish and wildlife, physical characteristic, land use, and other environmental data. The Lake Michigan LaMP has also begun identifying indicators to guide these monitoring efforts. If the environmental indicators identified by the Lake Michigan LaMP are to support future

management decisions, they must be adopted by monitoring programs basinwide and used to guide sampling and assessment parameters and media. Over the last 2 years, efforts have been undertaken to gather data on wetlands, beaches, stream buffers, and other items that will ensure that the goal status changes from mixed to mixed/improving by 2010 and to good by 2020. The following section describes these data collection efforts.

### Challenge

To expand Lake Michigan basin monitoring collaboration and coordination by promoting data comparability and joint planning and to deliver efficient and timely reporting on the status of the Lake Michigan ecosystem.

### Environmental Indicators

The Lake Michigan LaMP promotes use of environmental indicators to track progress in achieving the LaMP goals. For a list of potential indicators, see Chapter 3 of LaMP 2000. The concept of environmental indicators is not new. State and federal agencies have used indicators to track trends in environmental health, particularly fish population trends and to help guide management decisions. Effective use of the LaMP indicators



**Great Black Backed Gull**

Photography courtesy of the National Park Service, Indiana Dunes National Lakeshore\*



## Air Deposition Monitoring Recommendations

### Recommended actions from the Delta Institute and the Lake Michigan Forum include:

- creation of an adequate monitoring network and comprehensive emission inventories; enhancement of regional modeling efforts;
- examination of the implications of urban air toxics initiatives;
- application of environmental management systems;
- extension of pollution prevention techniques to agricultural practices;
- consideration of a total maximum daily load (TMDL) calculation for Lake Michigan;
- targeted emission reductions from federal facilities; and
- integration of reduction targets into energy policies.

### Recommended actions from the IAQAB include:

- completion of the Lake Michigan Mass Balance Study for pathways other than atmospheric deposition;
- extension of that Mass Balance to other contaminants;
- improvement of emission inventories, particularly for point and areal dioxins sources within 100 km of the Lake Michigan basin and for dominant areal, and largely unquantified sources of PCBs and other banned contaminants;
- development of a predictive, first estimate model for areal urban emissions of banned contaminants ;
- use of models to estimate emissions of residual banned pesticides from agricultural practices;
- and the continuation and extension of enhanced ambient measurement schemes to better estimate areal and regional loading and support model verification.

will link actual environmental responses directly to programs and activities.

The LaMP indicators are environmental, social, and economic measures used to assess the achievement of LaMP goals and objectives. These indicators will demonstrate improvements in and protection of the Lake Michigan ecosystem and will function as an early warning system to identify pressures on the ecosystem. The indicators will measure conditions such as ecosystem integrity, aquatic health, human health, and the quality of life.

## State of the Lakes Ecosystem Conferences

Additional work has been completed on the indicators over the past 2 years through the State of the Lakes Ecosystem Conference (SOLEC) process. The SOLEC is hosted biennially by U.S. EPA GLNPO and Environment Canada. The last SOLEC was held in October 2000 in Hamilton, Ontario. The next conference will be held in Cleveland, Ohio, in October 2002. The conferences are intended to provide a forum for exchange of information on the ecological condition of the Great Lakes and surrounding lands. A major goal is to bring together a large audience of government (at all levels), corporate, and not-for-profit managers to discuss problems that affect the lakes. The conferences have led to information gathering by a wide variety of agencies and organizations. In the year following each conference, a State of the Great Lakes Report is prepared by the governments based on the conference itself and on extensive public comments following the conference.

## Lake Michigan Monitoring Coordinating Council

The Lake Michigan Monitoring Coordinating Council was established to enhance coordination, communication, and data management among agencies and other organizations that conduct or benefit from monitoring efforts in the Lake Michigan basin in the interest of supporting the Lake Michigan LaMP.

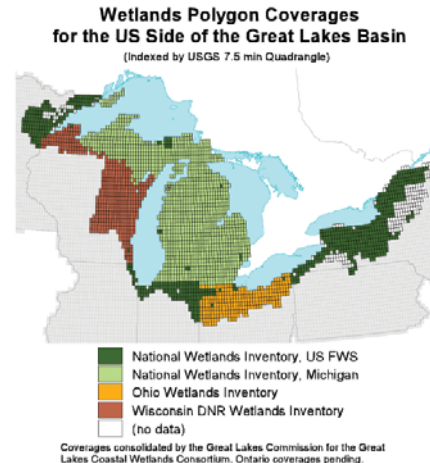
The Council has 31 members representing federal, state, tribal, and local governments, nonprofit watershed groups, and other environmental organizations, educational entities, and the regulated community. The Council meets twice each year in locations throughout the watershed. Council meetings, biennial conferences, and feedback from constituents shape the Council's work plan and activities. The Council will develop goals, each with an active working group, whose broad membership will expand the core Council membership.

In 1999, four short-term working groups were created to develop information to move the Council forward: Data Inventory and Analysis; Monitoring Objectives; Watershed Pilots; and Outreach and



## Great Lakes Wetlands Consortium

On November 29, 2000, EPA's GLNPO awarded a cooperative agreement to the Great Lakes Commission for the first large-scale, binational, collaborative effort to assess the ecological health of Great Lakes coastal wetlands. A consortium brought together by the Great Lakes Commission will (1) design and validate indicators to assess the ecological integrity of Great Lakes coastal wetlands; (2) design an implementable, long-term program to monitor Great Lakes coastal wetlands; and (3) create and put coastal wetland data in a binational database accessible to all scientists, decision-makers, and the public. GLNPO has contributed \$400,000 to the effort, and the other consortium members are contributing over \$200,000. The consortium currently includes Great Lakes wetland scientists and resource managers from the U.S. and Canadian federal governments, states and provinces, nonprofit organizations, and academia. Similar funding levels are expected for each of the next 2 years. The award is premised on the recognized need to assess the health of Great Lakes coastal wetlands, which are an integral part of the Great Lakes basin ecosystem. Coastal wetlands have critically important ecological values and functions, yet little basinwide data is available for assessing their ecological health. For this reason, a suite of 13 Great Lakes coastal wetland indicators was presented at SOLEC 1998. An assessment of five of these indicators was presented at SOLEC 2000 in Hamilton, Ontario. The consortium's work will expand the monitoring and reporting capabilities of the United States and Canada under the GLWQA. For additional information, contact Karen Rodriguez of GLNPO at 312-353-2690 or [rodriguez.karen@epa.gov](mailto:rodriguez.karen@epa.gov).



Map courtesy of the Great Lakes Commission



Wetlands within Illinois Beach State Park  
Photograph by David Riecks, Illinois-Indiana Sea Grant\*

various resource-based monitoring entities and other affected stakeholder groups.

The working groups formed under this new framework will build on the efforts to coordinate monitoring within individual resources by groups such as the Lakewide Management Plan Committees, the Wisconsin Groundwater Coordinating Council, and the Great Lakes Fisheries Commission. Each of these resource-based working groups will coordinate existing monitoring networks around several common considerations: monitoring objectives; spatial, temporal and parameter network design; methods comparability; quality assurance and control planning; database sharing; and data analysis approaches.

### Lake Michigan Monitoring Assessment

The Great Lakes Commission, in partnership with EPA and the Lake Michigan Monitoring Coordinating Council, issued a report on Lake Michigan monitoring in October 2000. The report provides a comprehensive review of monitoring programs at the federal, state, and local levels for targeted watersheds; an analysis of gaps,

Collaboration. The progress of those short-term working groups set the stage for the development of a new Council operating framework in 2001.

The new Council framework has been developed to increase coordination between appropriate monitoring entities, allow the development of a strategic plan for monitoring, and add value to the individual efforts of the Council's member organizations. The new Council framework takes advantage of the logical interactions between the



## Lake Michigan Monitoring Assessment Recommendations

- Continue to update the monitoring inventory, and expand data collection to include all tributaries.
- Establish better lines of communication with state DNRs, USFWS, the U.S. Forestry Service, and the U.S. Department of Agriculture.
- Better integrate habitat and wildlife monitoring with traditional water quality monitoring.
- Improve information on the geographic locations of monitoring sites.
- Initiate planning for a coordinated sampling event for 10 years following the initial LMMB Study, and share data and modeling results with the public in a timely fashion through numerous outlets.
- Include academic research and data collection efforts in future updates to the monitoring inventory.
- Further examine the monitoring coverage of specific LaMP critical pollutants and emerging pollutants.
- Take better advantage of relatively untapped volunteer monitoring resources.
- Take better advantage of local agencies such as health departments, conservation districts, and planning agencies.
- Establish a better framework for bottom-up monitoring program linkages.
- Standardize data collection and reporting.
- Encourage federal, state, tribal, and local agencies to report monitoring coverage and results to a meta-database with universal access.
- Develop an on-line database of monitoring information that is geographically based and content-searchable.
- Develop and coordinate implementation of comparable methods to collect indicator data in a coordinated network.

Additional information is available at <http://www.glc.org/monitoring/lakemich>



Tributary Lakesheds represented in the Lake Michigan Monitoring Report  
Map courtesy of the Great Lakes commission

inconsistencies, and unmet needs; an assessment of the adequacy of existing efforts to support critical ecosystem indicators; and recommendations for addressing major monitoring needs, particularly those considered most important for lakewide management decision-making. The study focused

on monitoring in Grand Traverse Bay, White Lake, Muskegon Lake, the Grand River, the Kalamazoo River, the St. Joseph River, the Grand Calumet River, Waukegan Harbor, the Milwaukee River and Estuary, the Sheboygan River, the Fox-Wolf River Basin, Door County, the Menominee River, the Manistique River, and the open waters of Lake Michigan.

The report outlines a series of recommendations (see text box) for improving monitoring in Lake Michigan. These recommendations are having a broader impact as organizations and governments in the United States and Canada are beginning work on better coordinating the Great Lakes systemwide monitoring strategy.

## BEACH Monitoring

EPA initiated the Beaches Environmental Assessment, Closure, and Health (BEACH) program to strengthen individual beach programs and water quality standards, better inform the public, and promote scientific research to further protect the health of people who use beaches. EPA is improving laboratory testing methods for detecting contaminants at beaches and is assisting local governments in monitoring beach water quality. The





Great Lakes Commission is pilot-testing a program for communicating the results of the National Beach Survey, assessing the consistency of beach closures with restriction advisories, and creating maps that connect with the national BEACH effort.

## **Integrated Atmospheric Deposition Network**

U.S. EPA is a participant in the Integrated Atmospheric Deposition Network (IADN), established in July 1988, by the Atmospheric Deposition Monitoring Task Force of the International Joint Commission. The objective of IADN is to acquire sufficient, quality-assured data to estimate the loading to the Great Lakes Basin of selected toxic substances. The relative importance of the atmospheric pathway can then be ascertained and appropriate control strategies developed.

## **Coordination of Monitoring**

The Great Lakes Water Quality Agreement requires that LaMPs “include a description of surveillance and monitoring to track the effectiveness of remedial measures and the eventual elimination of the contribution to impairments of beneficial uses...”

Monitoring collaboration and coordination need to be maximized in order to promote data comparability, enhance data utility, extend resources and deliver efficient and timely reporting on environmental change and progress as measured by Lakewide Management Plans (LaMPs) and State of the Lakes Ecosystem Conference (SOLEC) indicators.

Responsibility for monitoring in the Great Lakes is divided among a vast number of program and agencies throughout the basin. While these monitoring efforts meet individual program needs and mandate, the lack of consistency in protocols and methodology limits the usefulness of the resultant data for sharing, comparing and opportunities coordination might provide. The Binational executive Committee( BEC) sponsors two frameworks for developing indicators and reporting on the status of the Great Lakes ecosystem: LaMPs and The State of the Lakes Ecosystem Conference (SOLEC)..

BEC requested agencies to investigate the opportunities to enhance monitoring coordination and prepare a status report for the BEC Spring 2002 meeting and a set of options for the Fall 2002 meeting. A series of workshops are being conducted to develop a draft proposal.

## **Volunteer Monitoring**

Volunteer monitoring is integral to the effort to assess the health of our nation’s waters. Government agencies have limited funds for monitoring and have found that volunteer programs can provide high quality, reliable data to supplement their own monitoring programs.

The U. S. Environmental Protection Agency’s Oceans and Coastal Protection Division, in partnership with The Ocean Conservancy and Lake Michigan LaMP , coordinated a free, two-day workshop March 19,20,2002 at the Illinois Beach Resort and Conference Center in Zion, Illinois.

The 54 attendees were:

- Leaders of local volunteer water quality monitoring programs
- Teachers conducting student water quality monitoring programs
- Local, state, regional, and federal agencies working with water quality issues

Workshop participants reviewed valuable techniques for establishing or improving monitoring operations, ensuring the quality of data collected, enhancing training efforts, and improving program management. In addition, the workshop promoted coordination and networking among volunteer monitors and government agencies operating in the Great Lakes basin.

The Marsh Monitoring Program (MMP) gave a presentation on their network of volunteer opportunities to help conserve Great Lakes amphibians and birds and their threatened wetland habitats through a binational, long-term monitoring program, Initated in 1994 by Bird Studies Canada and Environment Canada, the MMP has been developed and expaned through the additional support of the US EPA Great Lakes National Program Office and Great Lakes Protection Fund as well as committed individuals and private



foundations. The MMP reports are respected and utilized by those attempting to track conditions in the Great Lakes. Additional Lake Michigan basin volunteers are needed- contact :[www.bsc.eoc.org](http://www.bsc.eoc.org) or call 1-888-448-2473.

## **Air Deposition Monitoring**

During the 1999-2001 priority work cycle, the International Air Quality Advisory Board (IAQAB) and the Great Lakes Science Advisory Board (SAB) held two workshops, in cooperation with the Delta Institute and the Lake Michigan Forum, focusing on the capability of atmospheric models to support the development of policies, including source control strategies, by confirming deposition trends and identifying significant sources of persistent contaminants.

At the workshops, presentations from leading researchers and modelers were followed by discussion of the policy implication of their work. Participants included representatives of municipal, state and provincial governments, the U.S. and Canadian governments, universities, consultants, industry and environmental group. A Task Force has been formed in response to the many recommendations.

## **Next Steps**

- Monitoring research and development will be presented for the critical pollutant Watch List.
- A LMMB Study report will be prepared for each contaminant studied added to the LaMP 2000 online.
- Progress will be made in prioritizing indicators for the lake and monitoring them.
- The coordinated monitoring plan for the lake will be finalized.
- LMMB Study findings will be documented and model runs will be completed.

