Good morning.

In the first three presentations this morning we heard about the status and trends of the Great Lakes ecosystem based on indicators and the expertise of scientists. The assessments were broadly grouped into the categories of contamination, biotic communities, coastal zones, aquatic habitat, human health, land use – land cover, resource utilization, and climate change.

We face many issues and questions, but

Is the Great Lakes community responding to what the indicators are telling us?

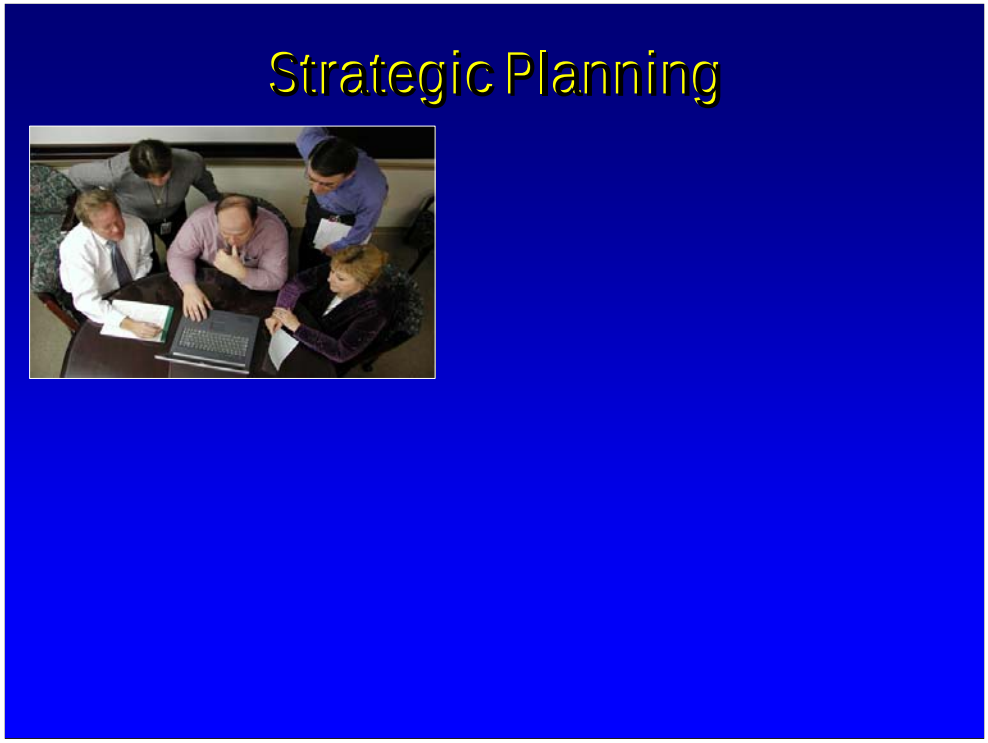
Are legislators, managers, scientists, and educators responding to the challenges we face?

We will examine these in this presentation by providing some examples of programs, projects, responses, and actions throughout the basin and for specific lakes.

Some specific lake actions can be a template for the other lakes.

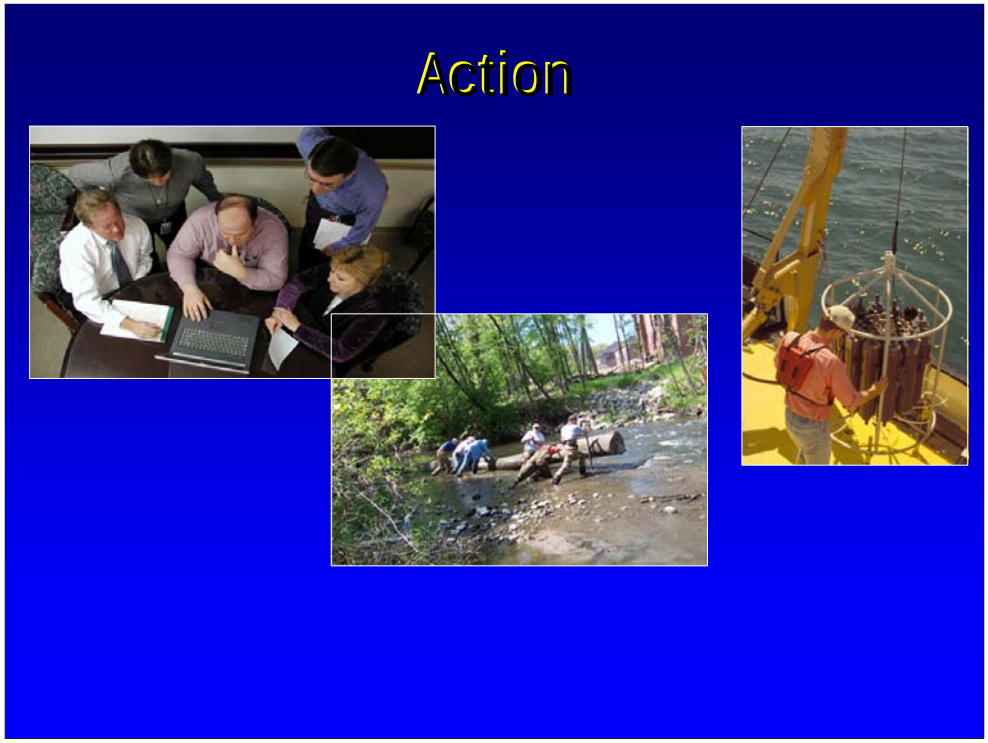
These seem to be pieces, but when sewn together they are the quilt of responses and actions, which move us forward in the protection and restoration of the Great Lakes.

In general, these projects fall into one of the following categories:



Strategic planning,

Research, monitoring and assessment,



Action,

Legislation

And education and outreach

Strategic planning is occurring at basin-wide, lake-wide and local scales. For example, the Great Lakes Water Quality Agreement is now under review.

In this presentation, there are numerous examples of lake-wide and local responses to issues presented earlier this morning. But first, lets talk about what's happening with the Canada Ontario Agreement (COA) and the Great Lakes Regional Collaboration.

The Canada-Ontario Agreement is the federal-provincial agreement that supports the restoration and protection of the Great Lakes Basin Ecosystem. The Agreement between the governments of Canada and Ontario outlines how the two governments will cooperate and coordinate their efforts to restore, protect and conserve the Great Lakes basin ecosystem. It builds on the actions taken through previous agreements, and focuses priorities for future actions. To this end, Ontario and Canada have enlisted the support of local and regional governments, industry, community and environmental groups. The Agreement also contributes to meeting Canada's obligations under the Canada-United States Great Lakes Water Quality Agreement.

The current Canada-Ontario Agreement ends March 2007. The Government of Canada and the Province of Ontario would like to extend the COA until March 2009 while negotiating a new Agreement which will assist with focusing on the priorities for future actions and recognizing the need to continue to tackle the most pressing issues in the Great Lakes basin.

Strategic Planning

Great Lakes Regional Collaboration

In the US, ten federal agencies together administer more than 140 different federal programs that help fund and implement environmental restoration and management activities in the Great Lakes basin.

To increase coordination among the agencies, the President signed Executive Order Number 13340 on May 18th, 2004.

The Executive Order calls for collaboration and coordination, the development of outcome-based goals such as cleaner water, sustainable fisheries, and biodiversity, and calls on the Great Lakes Regional Collaboration and the Federal Task Force to ensure federal efforts target measurable results.

Members include federal representatives, the Great Lakes Mayors, Great Lakes Governors, Great Lakes Tribal Leaders, and The Great Lakes Congressional Delegation.

The Lakewide Management Plans provide ecosystem-based, management strategies for each of the five great lakes. These management plans focus on near and long-term actions and are developing sustainability strategies. Each LaMP identifies priority needs and objectives as well as the corresponding management actions required to address the problems.

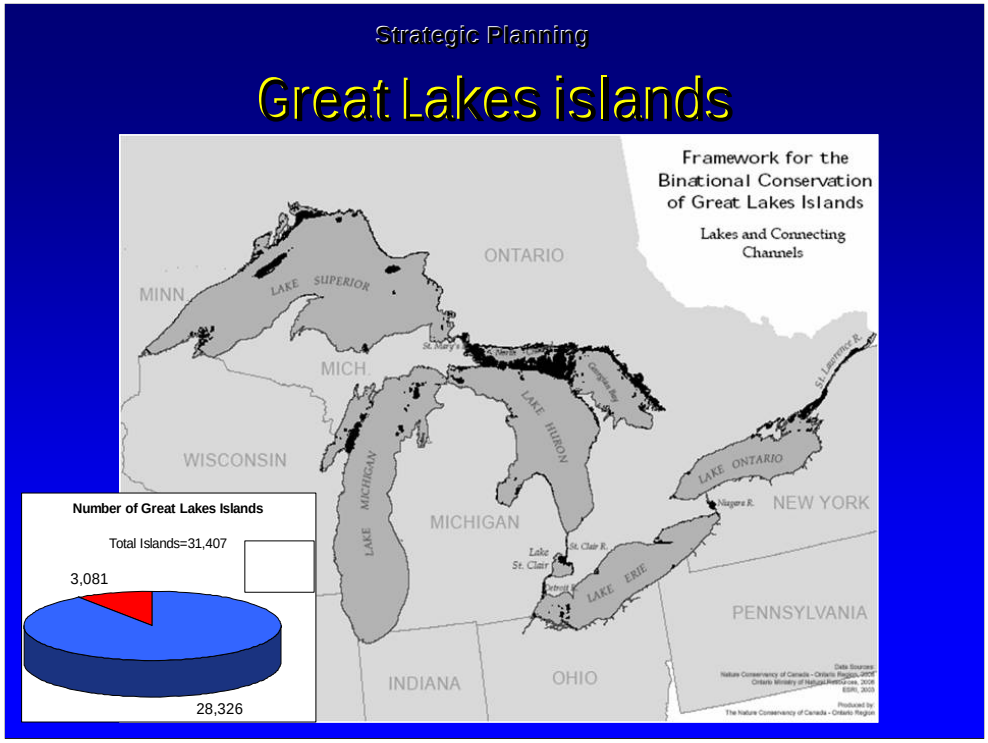
Some critical issues such as aquatic nuisance species, protecting habitat, contaminated sediments, drinking water, and beach closings require immediate attention and resound throughout all of the LaMPs.

Other issues continue to be the subject of public dialogue, long-term monitoring and continued research.

The RAPs and the LaMPs are similar in that they both use an ecosystem approach to assessing and addressing environmental degradation of the 14 beneficial use impairments outlined in Annex II of the Great Lakes Water Quality Agreement. Both include a public involvement process. RAPs, however, encompass a much smaller geographical scope while the LaMPs focus on a lake-wide scale.

Of the 43 AOCs originally designated, three have now been delisted, two in Canada, Severn Sound and Collingwood Harbour, and more recently, Oswego, in the US. Two other AOCs are in the recovery stage.

The continuing strong and close relationship between the LaMPs and RAPs is essential to the success of both programs.



Throughout the Laurentian Great Lakes there are over 31,000 islands. These islands form the largest collection of freshwater islands in the world and their biodiversity is of global significance.

A binational group, the Great Lakes Island Collaboration, has mapped and ranked all Great Lakes islands or groups of islands for biodiversity importance.

The group is finalizing a strategy for management, protection and restoration based on input from scientists, natural resource managers and also the island residents themselves.

Meetings were held with residents last year to share information and determine priorities. Future actions will be geared towards these conclusions.

Wetlands protection and restoration issues are receiving attention from agencies and organizations around the basin.

In the Lake Michigan basin, for example, after reviewing habitat losses, the 2006 Lake Michigan LaMP has proposed to increase net wetlands by 125,000 acres.

Eighty-nine thousand of these acres would be in Michigan, 30,000 in Wisconsin, and 3,000 acres each for Illinois and Indiana.

The plan is to accomplish the goal through agency and private efforts such as Coastal America's, Corporate Wetland Restoration Partnership Program.

Agricultural issues are a major concern, particularly in the Lake Erie basin.

The US Natural Resource Conservation Service has developed a plan to use Rapid Resource Assessments, Area-Wide Planning, and the acceleration of USDA Farm Bill programs to address the resource concerns. With contributing watersheds, the total project area is about 4.9 million acres.

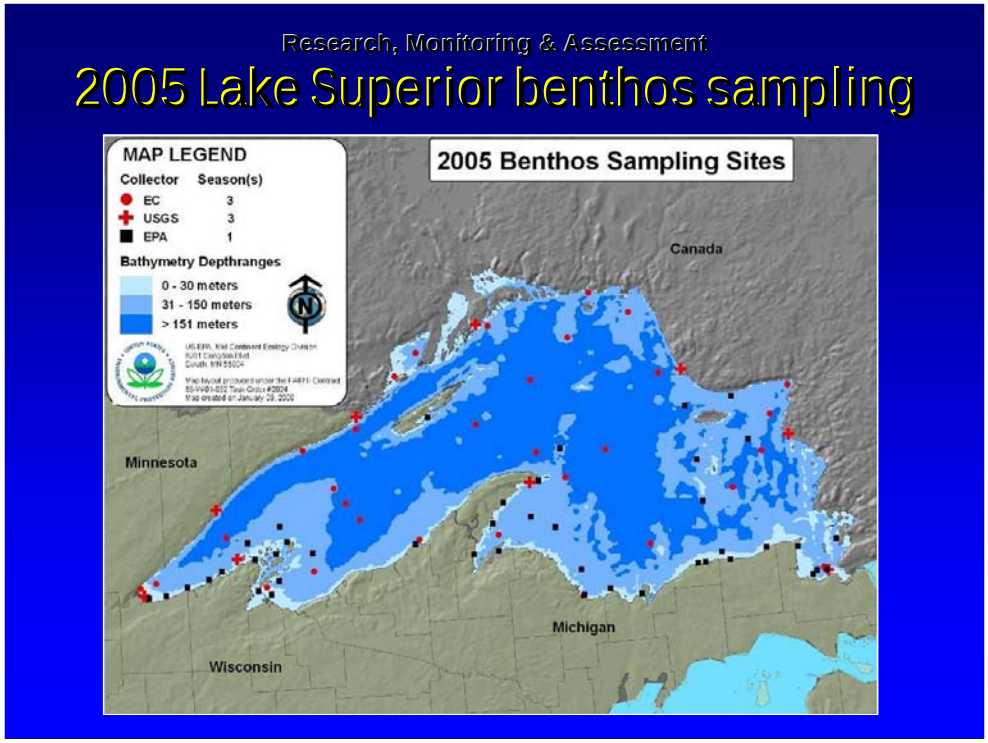
As shown in this photo, a plan will be developed that estimates the acres of filter strips, riparian buffers, grassed waterways, and conservation tillage, such as no till, as well as a number of Comprehensive Nutrient Management Plans for manure management, waste storage structures, and pasture systems that will be needed to address concerns.

A 10-year plan for accelerating the participation in USDA Farm Bill programs will involve financial assistance to farmers in the form of cost sharing, practice payments, and technical assistance in planning and applying these practices.

Research, monitoring and assessment efforts are underway and continue at various scales. Both the United States and Canada have programs in place, are cooperating, and data sets are being integrated.

Coordinated monitoring, bringing together Canadian and U.S., federal and state, and university groups, began in 2003 with enhanced monitoring on Lake Ontario. A 5 year rotation, one lake per year, was established with this subsequent order:

Lake Erie in 2004, Lake Michigan for the U.S. and Lake Superior for Canada in 2005, Lake Superior in 2006, Lake Huron in 2007 and Lake Ontario in 2008. In each monitoring effort, an extraordinary amount of information was collected, much more than one agency could accomplish on its own. The data needs of the LaMP managers have been addressed in all instances and include physical, biological, and chemical investigations.

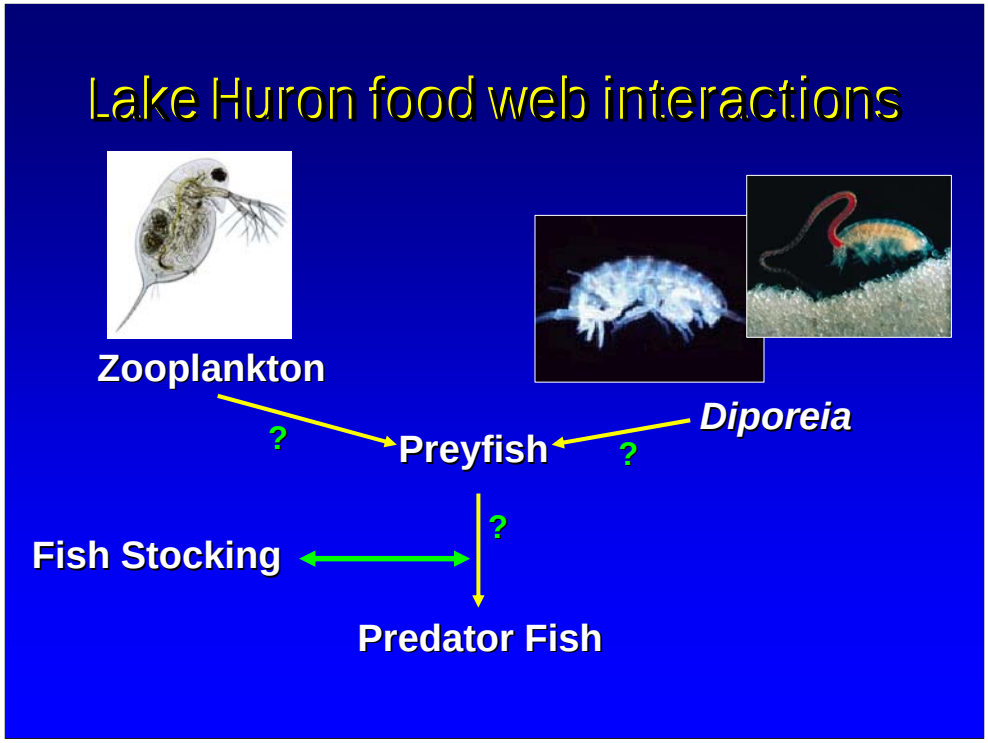


In 2005, natural resource agencies conducted the most extensive biological sampling effort on Lake Superior in history.

Six agencies from the U.S. and Canada coordinated efforts and shared resources to collect samples of organisms from microscopic plankton to fish in an effort to gain a thorough understanding of Lake Superior's lower food web.

Nearly 1,500 plankton and benthos samples were collected from the locations shown here.

Also, automated optical phytoplankton and zooplankton counters were towed by vessels and data recorded along transects totaling 1,000 km.



A major cause for concern in all the Great Lakes is the aquatic food web. With the collapse of the Lake Huron lower food web, for example, current responses are focused towards assessing if initial theories regarding the mechanisms involved in these changes are correct.

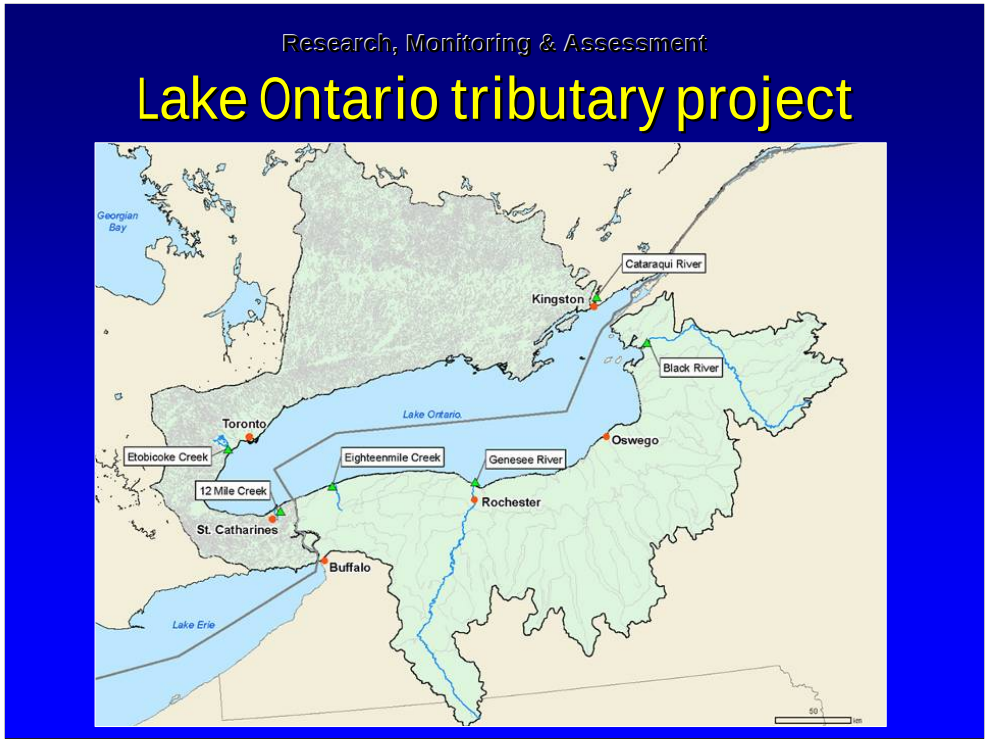
A year of cooperative, coordinated monitoring is planned for 2007 to measure the potential bottlenecks for the lower food web and resulting implications on other trophic levels.

This information will be used by the Great Lakes Fishery Commission's Lake Huron Technical Committee to direct future management actions in order to balance prey and predator fish populations.

Understanding the impacts of stressors on the ecological processes in Lake Ontario over the last three decades resulted from a commitment to long-term binational studies by environmental agencies and scientists in both Canada and the United States.

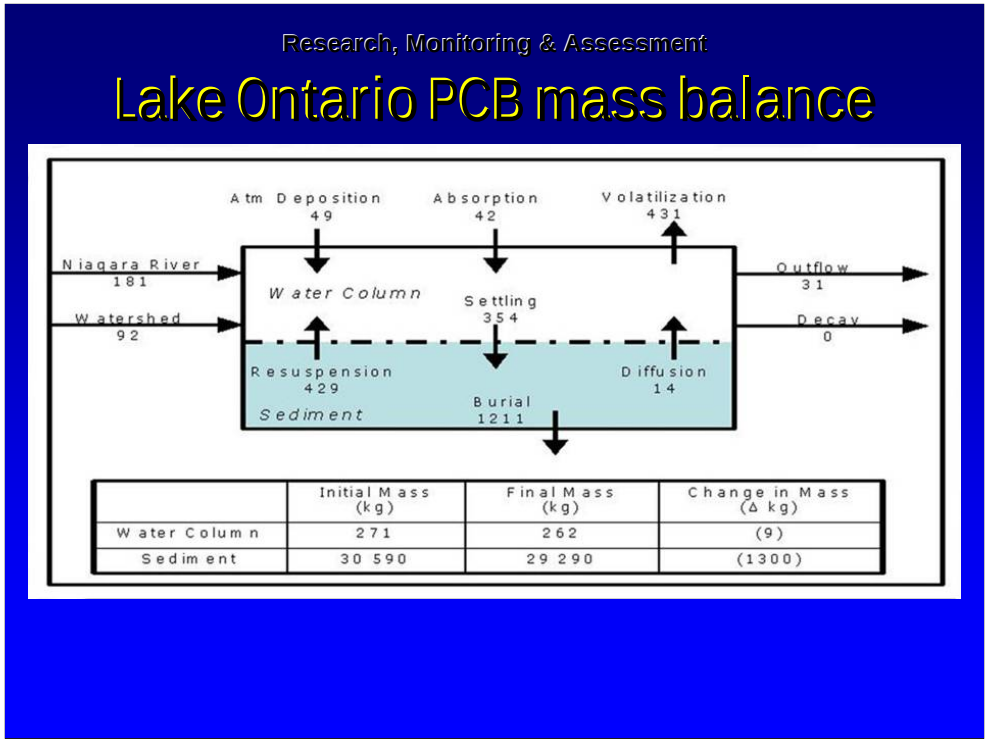
The Lake Ontario Lower Aquatic food web study, also known as LOLA, was initiated at the request of the Lake Ontario LaMP and the Great Lakes Fishery Commission's Lake Ontario Committee with the following two goals: 1) assess the status of and 2) develop recommendations for the long-term comprehensive assessment of the Lake Ontario lower aquatic food web.

Results of 2003 research provide the most comprehensive assessment of the status of Lake Ontario's lower food web since 1995.

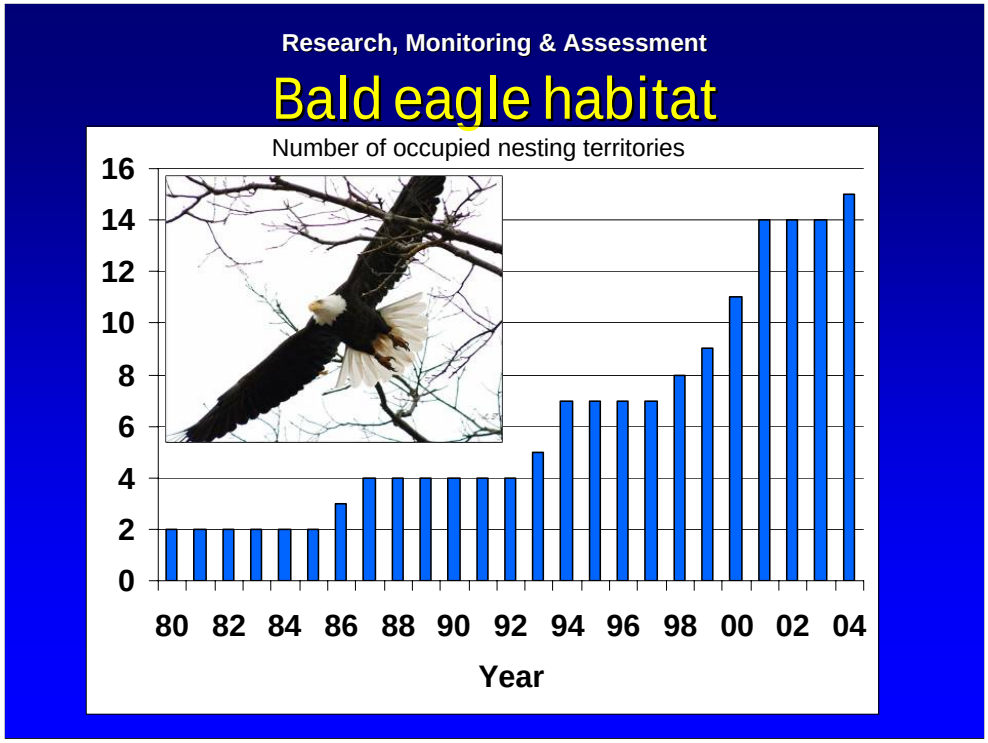


Canadian tributary trackdown is being conducted by the Ontario Ministry of the Environment and Environment Canada to track down and remediate sources of PCBs to Lake Ontario. The watersheds selected were Twelve Mile Creek, Etobicoke Creek and the Cataraqui River.

In the US, major tributaries to the Lake are being monitored for critical pollutants twice per year.

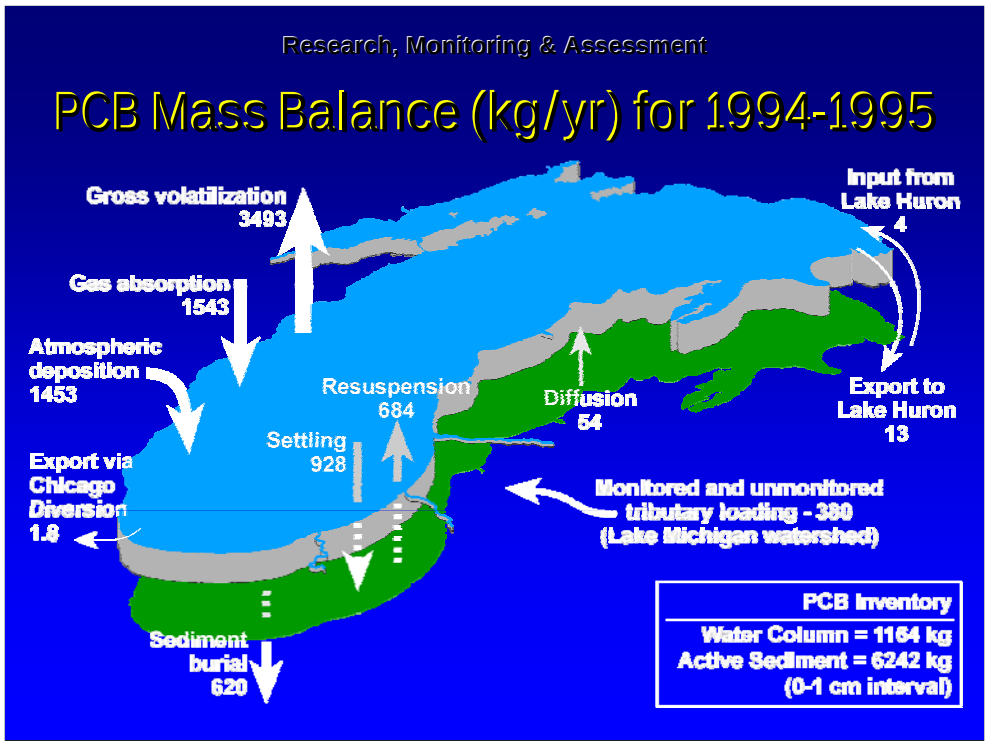


The Lake Ontario Mass Balance model was developed by a group of researchers with USEPA support and in coordination with the Lake Ontario LaMP. Arrows represent the input and loss processes included in the model. On an annual basis, the system loses approximately 1300 kg of PCBs, with the main loss mechanisms being sediment burial and volatilization.

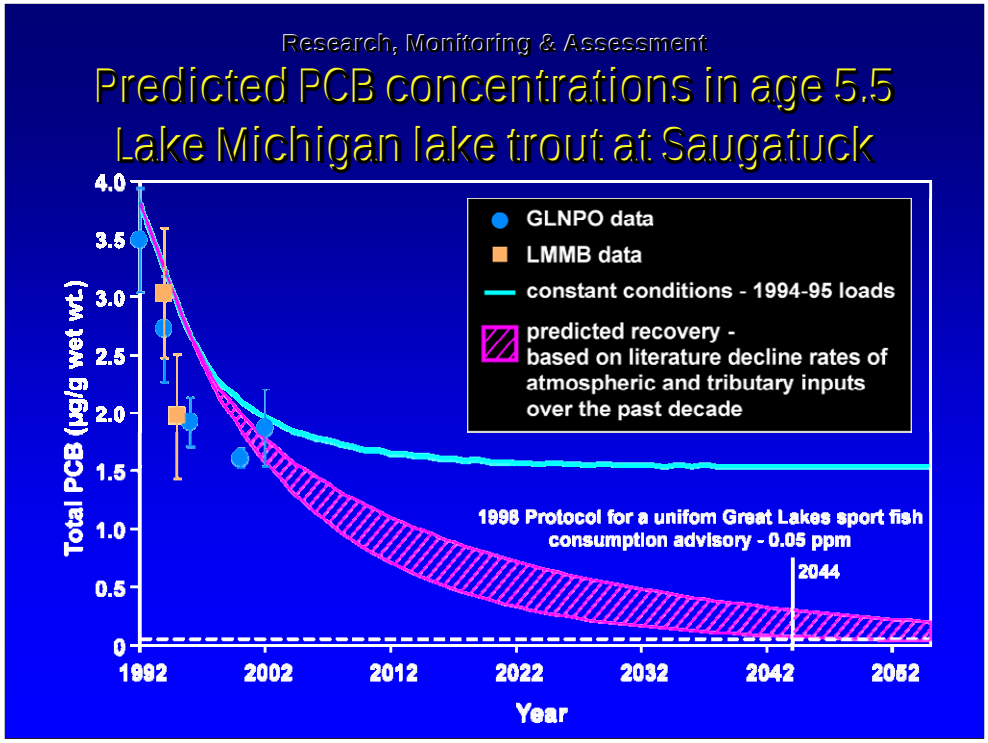


The binational Lake Ontario Lakewide Management Plan has adopted the bald eagle as one ecosystem indicator to be used to track progress in restoring the Great Lakes ecosystem.

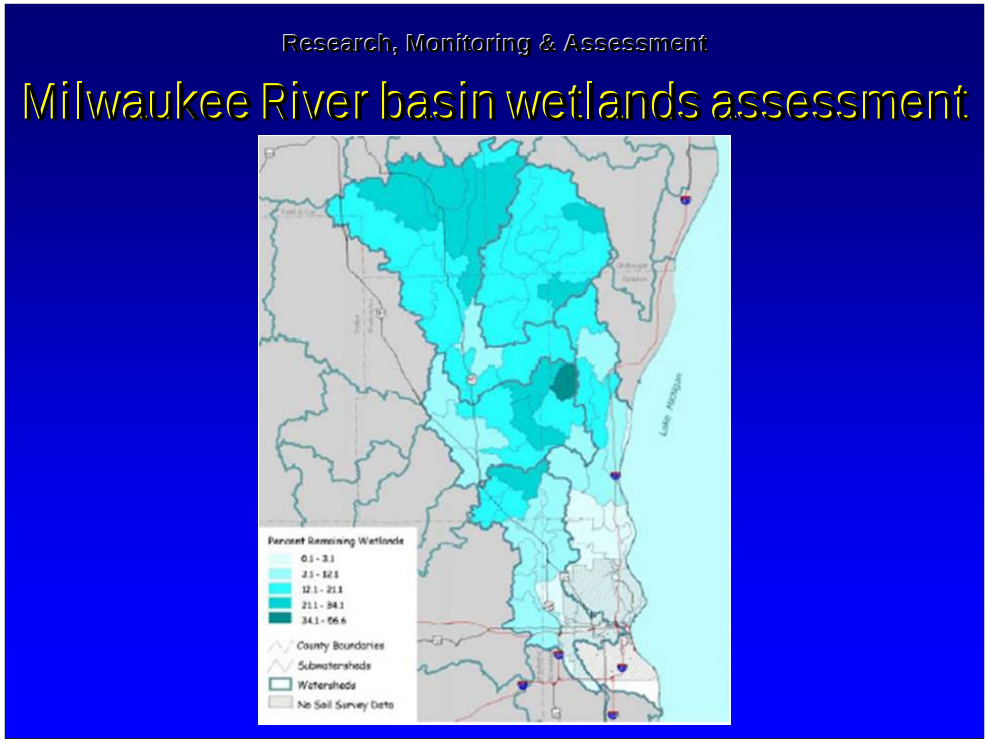
One binational project was designed to begin to identify and conserve sufficient suitable nesting and over-wintering eagle habitats and to limit human disturbance within eagle habitats to allow for its continued expansion throughout the Great Lakes Basin. This graph shows the increase in occupied bald eagle nesting along the Lake Ontario shoreline for a 24 year period.



Mathematical modeling has enhanced our understanding of the sources, transport, and fate of contaminants in these large systems. The Lake Michigan mass balance has shown that the largest source of PCBs to the system is from the atmosphere, through gas absorption and direct wet and dry deposition. The next largest source is from tributaries and watersheds. The largest loss of PCBs from the system is from gross volatilization to the atmosphere, followed by deep sediment burial. Most other source and loss mechanisms are relatively small. However, the pool of PCBs cycling between the sediment and water column is substantial, and it points to the need to continue efforts to prevent PCBs from entering the lake.



A forecasting capability from these models are also helping guide decisions for the future. Presented here are three alternative scenarios for Lake Michigan 5-6 year old lake trout. The upper forecast indicates that if all loads were frozen at the mid-1990 levels, fish tissue concentrations would level off and approach equilibrium concentrations. In contrast, the other forecast shows a range of recovery based upon differing decline rates, and shows that at the broad region at Saugatuck, fish tissue concentrations could be reduced to permit unlimited consumption, by as early as the year 2044. These forecasts suggest that there is light at the end of the tunnel, and this rate can be accelerated by pollution prevention and remediation, but signals that we are nearing the final chapter of a 100-year PCB story in the Great Lakes.



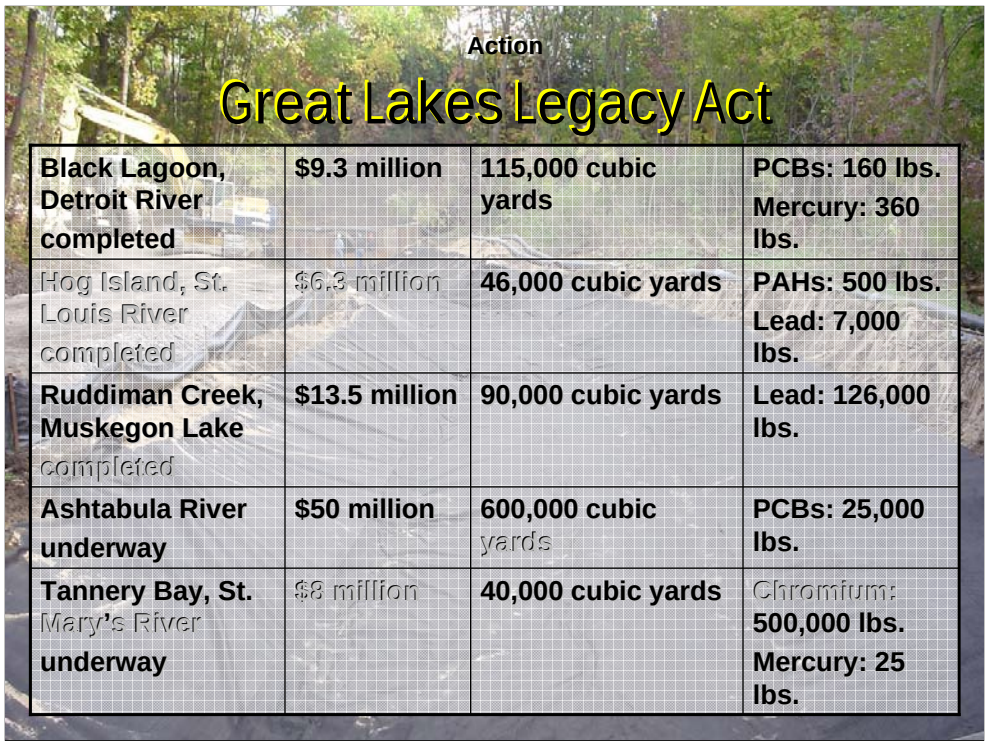
The Milwaukee River Basin Wetlands Assessment Project synthesizes existing GIS data with our current scientific understanding of wetland, watershed and landscape function to produce planning tools that assess major wetland functions or ecological services at the landscape level.

These tools are being used by local planners and decision-makers to predict the consequences of differing development and restoration scenarios and prioritize use of limited resources for wetland protection and restoration.

In addition to strategic planning and research, monitoring and assessment, numerous actions are tackling issues across the basin.

In the area of sediment remediation, the Great Lakes Legacy Act in the US, is making progress on cleaning up contaminated sediments in the Areas of Concern.

Shown here is the cleanup of Ruddiman Creek in Muskegon, Michigan which took place in 2005.



Contaminated sediment remediation at the Black Lagoon in the Detroit River, Hog Island in Superior, Wisconsin, and at Ruddiman Creek in Muskegon, Michigan, were completed over the last year and a half. Remediation is underway at Tannery Bay in the Upper Peninsula of Michigan and Ashtabula River in Ohio.

Cleanup of these five sites will result in the safe removal of nearly 900,000 cubic yards of contaminated sediments from our most polluted waterways.

A University of Illinois study has found that property values in AOCs increased following cleanups.

In another important conclusion to a series of actions, this last summer the Oswego River Area of Concern was delisted, the first delisting in the US.

The Oswego River AOC delisting was the result of actions taken to resolve beneficial use impairments, such as fish habitat and populations, eutrophication, improved control of water flow, and control of point and nonpoint discharges.

Action

Lake Superior clean sweep

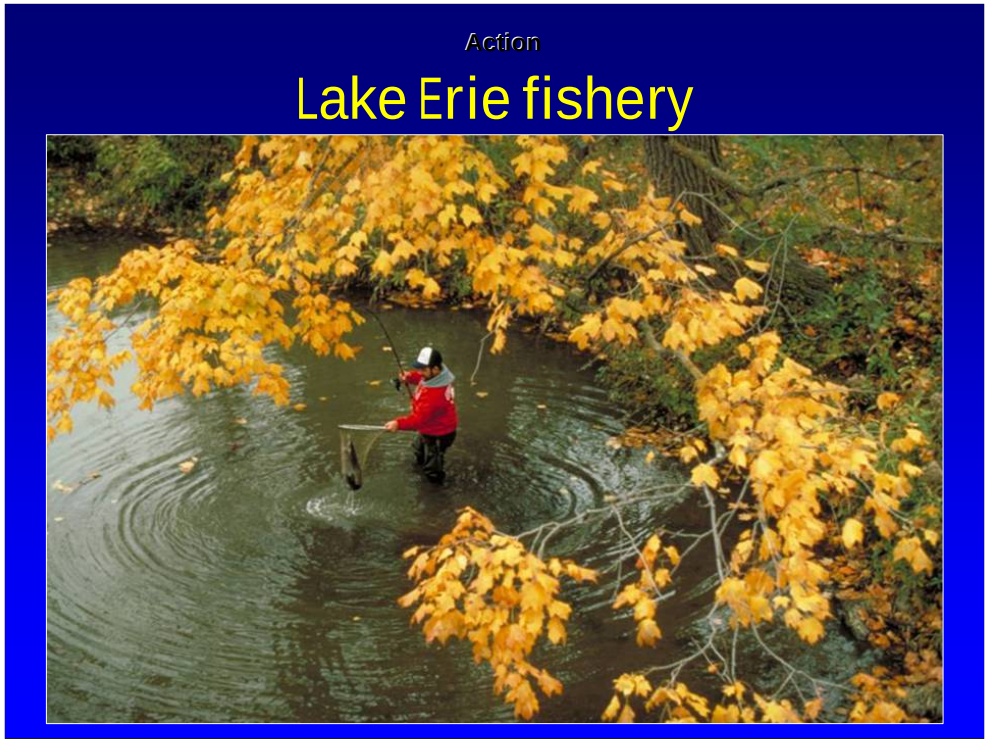
Lake Superior communities have embraced the goal of zero discharge of critical pollutants by engaging in a number of actions to remove contaminants.

The Earth Keepers, a faith-based environmental organization based in the Upper Peninsula of Michigan, comprised of 9 different faiths and over 120 congregations, held an electronic and hazardous waste collection program on Earth Day 2006. Over 300 tons of household hazardous waste, primarily household electronics, were collected, disposed of, and/or recycled.

In Canada, more than 11,500 mercury switches were collected in the Lake Superior basin in 2005.

EcoSuperior has started a florescent light recycling program for North Shore landowners.

In the town of Superior, Wisconsin dentists installed mercury amalgam separators and recycled 400 pounds of elemental mercury.



In the area of fisheries management, states such as Pennsylvania, respond to monitoring results by adjusting harvest regulations regarding seasons, sizes, creel limits, and gear restrictions for species such as Yellow Perch. Also in Ohio, the State is buying out the last three commercial fishing licenses and creel limits have been adjusted for walleye.

Toronto is addressing water pollution through the Wet Weather Flow Management Master Plan, which is a long-term plan to reduce the adverse effects of urban wet weather flow, which is runoff generated when it rains or snows.

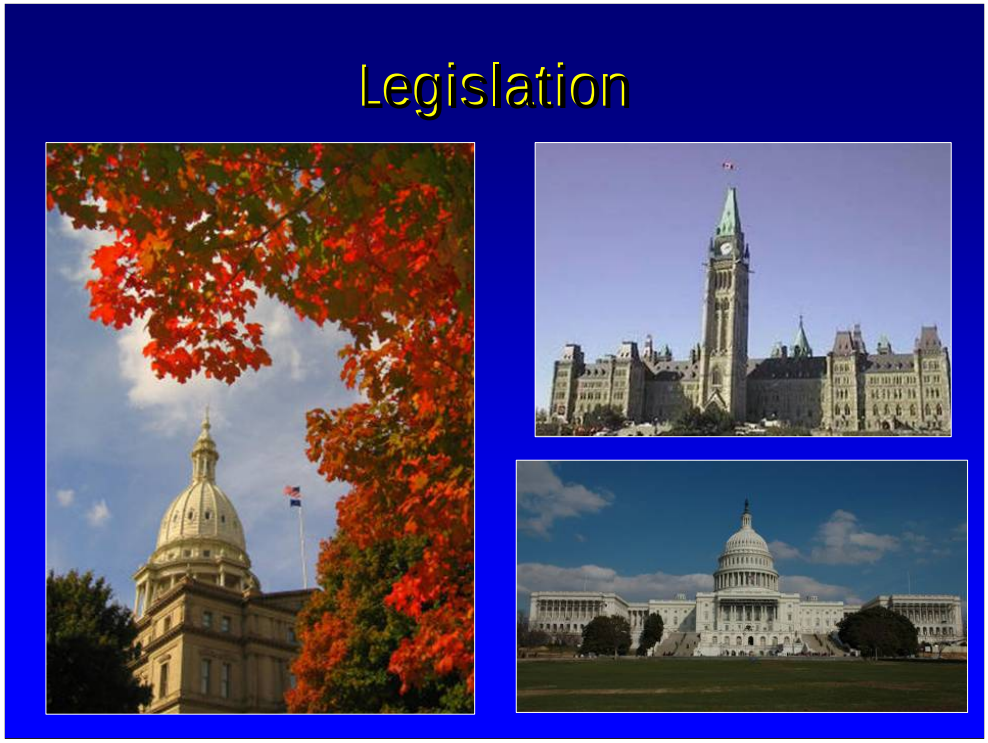
The benefits of the plan are clean waterfront beaches for swimming, elimination of discharges from combined sewer overflows, basement flooding protection, protection of city infrastructures from stream erosion, restoration of degraded local streams, reduction of algae growth along the waterfronts, and restoration of aquatic habitat.

The total capital cost for the 25-year plan is approximately $1.047 billion. Operational and maintenance costs to implement the capital projects is an estimated $16 million annually.

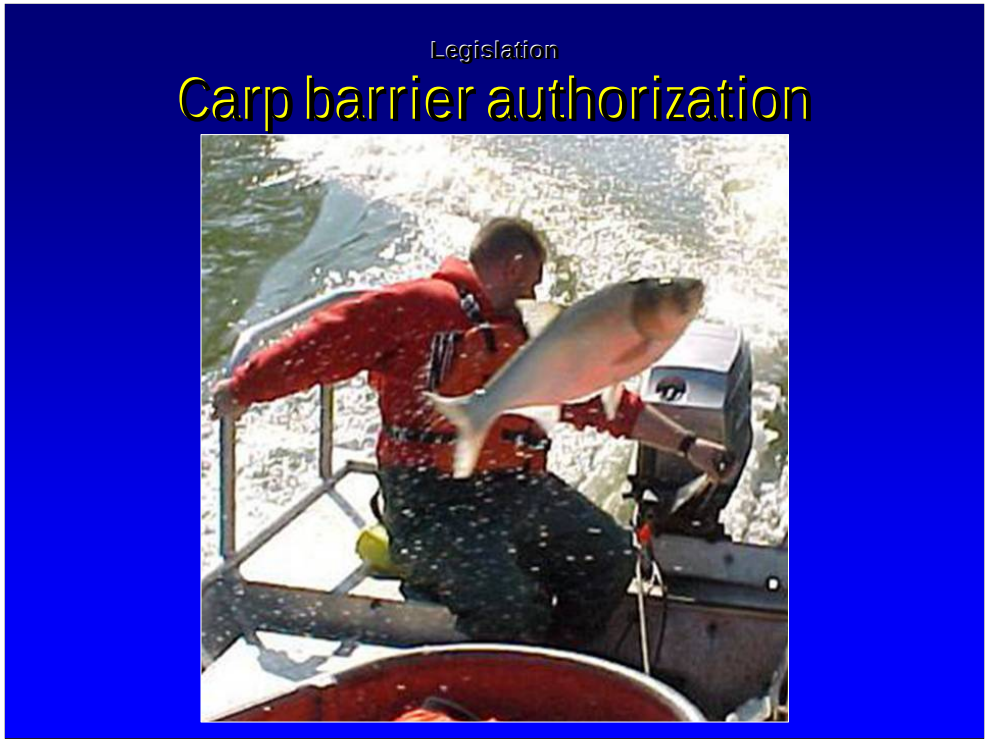
By purchasing a working forestry easement on 248,000 acres across the Upper Peninsula, The Nature Conservancy along with the State of Michigan and The Forestland Group, has created the largest conservation corridor in the Midwest by connecting 2.5 million acres.

The project prevents land fragmentation and incompatible development by establishing buffers around major sites such as the Pictured Rocks National Lakeshore and Porcupine Mountains Wilderness State Park.

This Project not only provides the people of Michigan with the permanent protection of some of the state's most treasured landscapes, but helps protect thousands of timber and tourism jobs.



Over the last couple of years, legislation regarding environmental issues has been adopted at the federal, state, provincial, and local levels.



Federal and state agencies completed construction of an electrical fish barrier as a demonstration project to study the effectiveness of preventing species migration between the River and Lake Michigan.

The U.S. Army Corps of Engineers constructed the temporary electric dispersal barrier on the Chicago Sanitary and Ship Canal at a cost of approximately $2.2 million in April, 2002. Construction of a permanent barrier system began in 2006. This permanent barrier is made up of 2 sets of electrodes causing fish to turn back rather than pass through the electric current. $9.1 million of federal and state funds were originally allotted to complete construction, but additional funding to complete and maintain the barrier system is not yet finalized.

In October 2006, the US Fish and Wildlife Service proposed the addition of several species of exotic carp to the list of injurious species under the Lacey Act. The deadline for submitting comments is November 6, 2006.

Low lake levels have exposed aquatic vegetation along shorelines. The vegetation is viewed by some as a nuisance and by others as a protected wetland.

The Michigan legislature acted to temporarily streamline authorizations for beach maintenance, grooming and vegetation removal on exposed bottomlands.

Recent research shows that these wetland disturbances and fragmentation have negatively impacted local plant and animal species.

As the act sunsets, the Governor of Michigan has set up a workgroup of all affected parties to work out a compromise resulting in the development of a policy or legislation for this issue.

About 15 years ago the Council of Great Lakes governors adopted a uniform fish advisory for PCBs in recreational fish.

Currently 46 U.S. states have mercury fish advisories, and EPA and the Food and Drug Administration are working with those states to issue consistent mercury advisories concerning the consumption of fish.

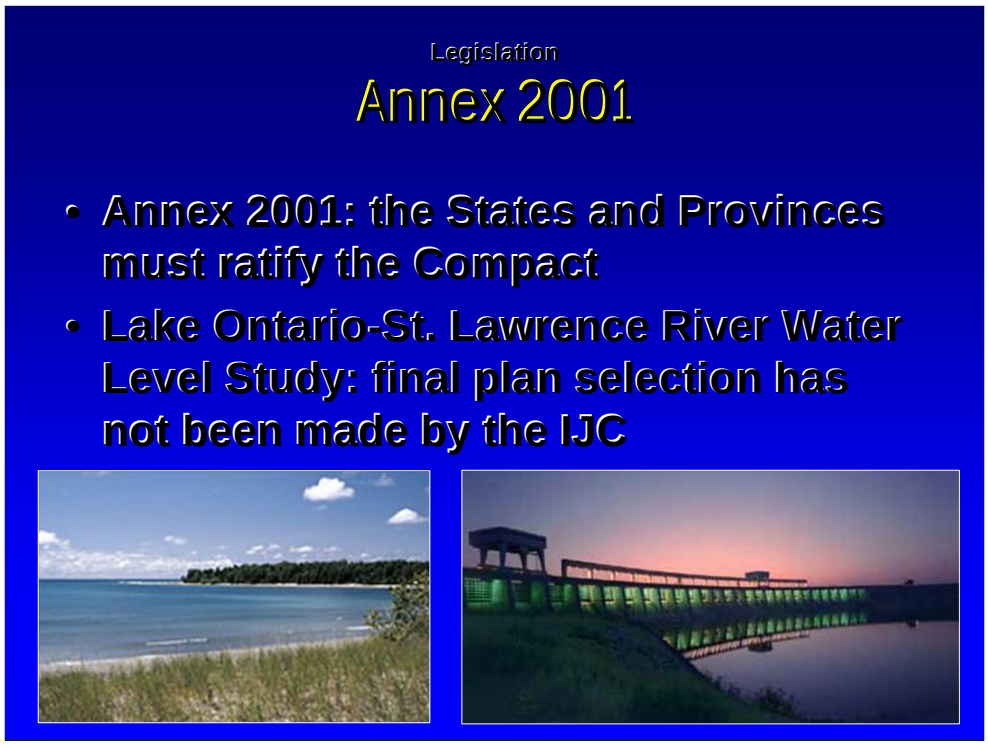
A new brochure, “Eat Fish but Choose Wisely”, was developed jointly by the intertribal council of Michigan, intertribal fisheries and assessment program, and the Chippewa Ottawa Resource authority. This new publication outlines wise fish consumption in the Northern Great Lakes and is a family guide for choosing, preparing, and eating Northern Great Lakes fish as part of a healthy diet. The brochure is targeted primarily towards vulnerable populations, but it is useful for all.

Building on the advice of the Greenbelt Task Force, and guided by thousands of comments and submissions from municipalities, more than 175 organizations and numerous individuals, the Government of Ontario has developed a Greenbelt Plan.

The Greenbelt Act, 2005 enables the creation of a Greenbelt Plan to protect about 1.8 million acres of environmentally sensitive and agricultural land in the Golden Horseshoe from urban development and sprawl. It includes and builds on about 800,000 acres of land within the Niagara Escarpment Plan and the Oak Ridges Moraine Conservation Plan.

In 2006, Michigan's governor signed into law several state Senate Bills creating a comprehensive regulatory framework for the management of water withdrawal and diversion from the Michigan portion of the Great Lakes basin. All withdrawals over 100,000 gallons per day will be managed.

The legislation also requires all new or increased bottled water operators with withdrawals over 250,000 gallons per day to meet very high standards.



On December 13, 2005, the Great Lakes Governors and Premiers signed agreements at the Council of Great Lakes Governors' Leadership Summit that will provide unprecedented protections for the Great Lakes–St. Lawrence River Basin.

The agreements detail how the States and Provinces will manage and protect the Basin and provide a framework for each State and Province to enact laws for its protection, once the compact is ratified.

In another related issue, the International Joint Commission's Lake Ontario-St. Lawrence River Water Level Study shows the effects of changing the way water levels are controlled by dams on the St. Lawrence River.

Following review of the public comments, a final plan will be selected by the IJC.

Finally, numerous education and outreach events and publications are available for many of the issues discussed this morning. We will talk about just two today.

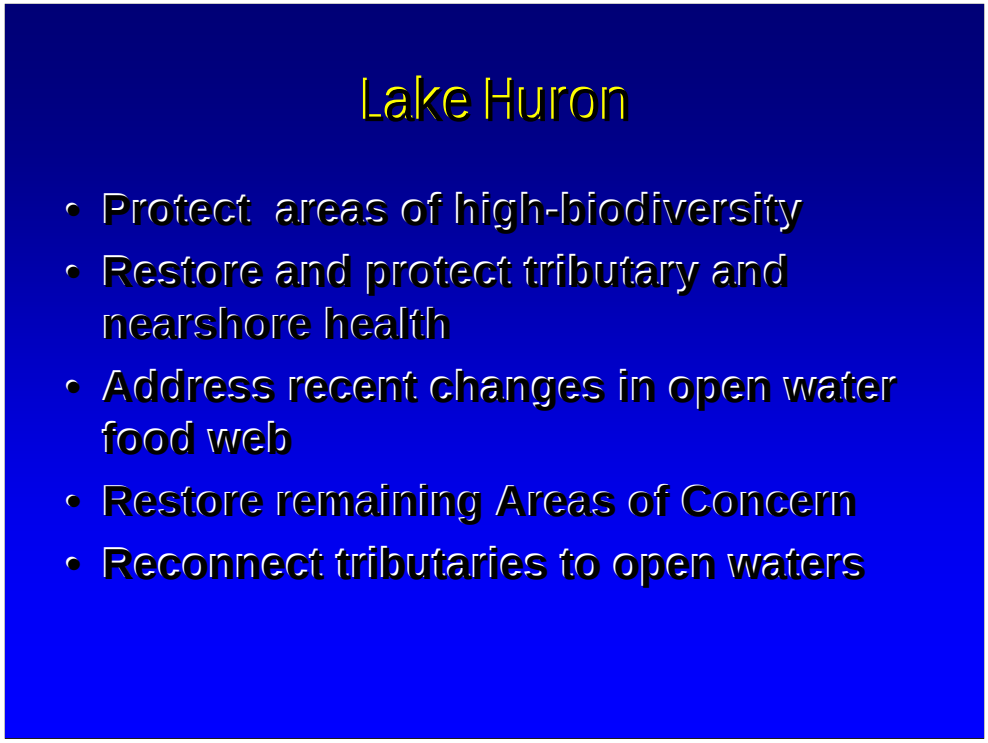
The invasive free zone project in the Lake Superior basin combines two federal agencies' lands, private lands, and state education programs, to inventory, plan, control, demonstrate, and educate within a designated 720 acre area. The project site includes the Whittlesey Creek National Wildlife Refuge, the lands, facilities and partners of the Northern Great Lakes Visitor Center, and private landowners within the national wildlife refuge boundary. The goal is to eliminate non-native invasive terrestrial and emergent aquatic plants in the entire area.

Funded by the Illinois-Indiana Sea Grant and the U.S. Fish and Wildlife Service, Chicago‘s Shedd Aquarium opened a new exhibit featuring many of the invasive species found in the Great Lakes. It is the first time in Chicago that the public has the opportunity to see many of these live animals and plants in person. The exhibit is part of the Shedd’s Great Lakes Conservation Initiative, which aims to draw public hands-on attention to the value and vulnerabilities of the Great Lakes, and is highlighted in teacher workshops.

Finally, this morning, LaMP managers have provided us with lake by lake actions to address threats to the Great Lakes ecosystem, and sets the stage for LaMP discussions here in Milwaukee. Many of these priorities are common across all the lakes, but at this time, we would like to highlight some of the more unique ones that each lake is emphasizing.

The Lake Superior LaMP determined six priorities are critical to addressing ecosystem issues. Included in these are the need to continue projects targeting Lake Superior critical pollutants, including mercury, dioxin, and PCBs, with attention to contaminated sediments, pesticide collections, and out-of-basin source reduction.

Another is to formulate a coordinated, integrated sustainability strategy that encourages outreach, water conservation, energy efficiency, and waste reduction.



Among the Lake Huron Binational Partnership's actions are:

The continuation of support of the Great Lakes Fishery Commission's binational approach to address recent changes in the open water food web,

and, to continue to support dam removal, reconnecting fish passageways between tributaries and the open water.

The Lake Michigan Lakewide Management plan also has a lengthy to-do list.

A high priority is to turn on the Asian Carp Barrier and turn off the ballast water pathway for Lake Michigan, which has implications for all of the Great Lakes.

LaMP 2006 has also set targets to pursue 77,000 acres of buffer strips on rural streams and restore and protect 125,000 acres of wetlands.

In Lake Erie, nutrient inputs from both point and non-point sources must be managed to ensure that ambient concentrations are within bounds of sustainable watershed management and consistent with the Lake Erie vision and goals.

There must be ecologically wise and sustainable use of natural resources to balance access, use and integrity. Outdoor recreation, commercial fishing, logging, water withdrawals, and other human factors must be managed to ensure that the integrity of ecological communities are maintained and/or improved.

The Lake Ontario LaMP's response to the rapid urbanization of the Golden Horseshoe is the full support of Smart Growth, and actions that minimize impacts from loadings.

Additionally, the Binational Habitat Conservation Strategy was initiated last year to develop ways to conserve and restore the biological diversity of Lake Ontario and the upper St. Lawrence River. The project is mapping target areas such as coastal habitats, pelagic and benthic zones, tributaries and connecting channels and will identify and define the actions needed to conserve these areas.

We have made considerable progress with past and present responses and programs. Clearly we have a great number of challenges facing us, both legacy and emerging.

It appears that communication and timing continue to be extremely important, and that is getting the right information to the right people at the right time.

This is where the scientists, managers, and community are stepping to the plate to respond, aid in decision making, and take action, in order to sew together the quilt of Great Lakes resource management, protection, and restoration.

We wish to thank all those who have contributed to this presentation.