

*EPA and the other members of the Interagency Task Force (IATF) have developed this Great Lakes Multi-Year Restoration Action Plan Outline for the purpose of public consultation. It is a work in progress, which Federal agencies want to finalize in consultation with States, Tribes, local governments, and other Great Lakes stakeholders. EPA and the IATF will use this framework as a starting point for discussions about the overall direction and focus of the Great Lakes Restoration Initiative (GLRI). Following our public consultations, we expect to add information about how the GLRI will address specific high profile, basinwide issues (for example, non-native invasive mussel species) as well as critical but more localized issues (for example, contaminated sediments).*

*EPA also is soliciting feedback on goals, objectives, measures, and actions to ensure we are tracking the right activities, setting appropriately ambitious goals, and measuring them correctly. There are parts of this Great Lakes Multi-year Restoration Action Plan Outline for which the proposed goals, objectives, measures, baselines, and targets are fairly well developed, and others requiring additional work and greater specificity.*

*Stakeholder input is crucial for this Outline to be successfully developed into an accountable and actionable Restoration Action Plan. When completed, this will be the federal plan for the GLRI from federal fiscal year (FY) 2010 through FY 2014.*

## **GREAT LAKES MULTI-YEAR RESTORATION ACTION PLAN OUTLINE**

### **EXECUTIVE SUMMARY**

The Great Lakes Multi-year Restoration Action Plan Outline advances the Great Lakes Restoration Initiative by strategically identifying goals, objectives and targets for programs and projects to address the most significant environmental problems in the Great Lakes ecosystem. The U.S. Environmental Protection Agency (EPA), together with its federal agency partners on the Great Lakes Interagency Task Force, is leading this effort in consultation with many other stakeholders. This Action Plan Outline covers activities from 2010 through 2014. Similar to the Great Lakes Restoration Initiative 2010 Funding Plan, it builds upon the extensive planning and collaboration that was done by the Great Lakes Interagency Task Force and a wide variety of stakeholders and non-governmental partners in development of the 2005 Great Lakes Restoration Strategy to Restore and Protect the Great Lakes (the GLRC Strategy) and their subsequent collaboration over the last 5 years. This Action Plan Outline uses the GLRC Strategy as its base and will implement portions of that Strategy. The federal government proposes to use the resulting Action Plan in the development of the federal budget for Fiscal Year 2011 and future years.

The Action Plan Outline incorporates outcome-oriented performance goals and measures to direct Great Lakes protection and restoration funding to the following Focus Areas:

- Toxic Substances and Areas of Concern

- Invasive Species
- Nearshore Health and Nonpoint Source Pollution
- Habitat and Wildlife Protection and Restoration
- Accountability, Monitoring, Evaluation, Communication, and Partnerships

Funds will be used to strategically implement both federal projects and prioritized/competitive grants. (Note: These funds will not be directed toward water infrastructure programs that are addressed under the Clean Water or Drinking Water State Revolving Fund program.) Funding will be used or distributed directly by EPA through grants and cooperative agreements or through interagency agreement transfer of funds to other federal agencies for subsequent use and distribution. Most grants will be issued competitively. Annual reports to the President, beginning in 2011, will describe accomplishments to date, activities planned for the upcoming year, and progress toward meeting ecosystem goals.

# **GREAT LAKES MULTI-YEAR RESTORATION ACTION PLAN OUTLINE**

## **Introduction**

The Great Lakes are a national treasure and an important part of the physical landscape and cultural heritage of North America. Shared with Canada and spanning more than 750 miles from west to east, the Great Lakes provide water for consumption, transportation, power, recreation, and a host of other uses. The Great Lakes hold 20 percent of the world's fresh surface water, have a 10,000 mile coastline, and drain about 200,000 square miles of land. The Great Lakes Basin, which is home to over 30 million people in the U.S. and Canada, has unique landscape features such as sand dunes, coastal wetlands, over 30,000 islands, rocky shorelines, prairies, savannas, and forests. The Great Lakes region contains a diverse array of biological communities, including over two hundred globally-rare plants and animals and over 40 species that are found nowhere else in the world.

## **Challenges**

Despite their immense size, the Great Lakes are highly sensitive to biological and chemical stresses which are slowing or even reversing the restoration progress made through years of concerted effort and expenditures on the part of federal, state, and local governments and other stakeholders. The Great Lakes face a number of serious challenges. The most significant of these include toxic substances, invasive species, nonpoint source pollution and nearshore impacts, habitat and species loss, and a need for better information to guide decision making.

Although releases of toxic pollutants have been reduced significantly over the years, there is a legacy of contamination in sediments and continuing input through rivers and air. Excessive levels of contaminants are still found in fish throughout the system. All Great Lakes States and the Province of Ontario have fish consumption advisories. Mercury and other pollutants continue to enter the Great Lakes from nearby and global sources through air deposition. Newly recognized chemicals of concern are also being identified as potential threats to the chemical integrity of the Great Lakes. Of the 31 toxic hotspots identified as Areas of Concern in the United States more than 20 years ago, only one has been restored to the point where it could be delisted.

Aquatic invasive species cause ecological and economic damage, and they greatly complicate efforts to restore the Great Lakes. New species of invaders arrive at the rate of about one every eight months, adding to the more than 180 already established in the basin.

Pollution from nonpoint sources contributes to impaired water quality and excess nutrients. Many of our coastal areas also suffer from sewer overflows that contaminate the water and close the beaches.

Habitat destruction and degradation due to development, competition from invasive species, alteration of natural lake level fluctuations and flow regimes, poor land management, and habitat

fragmentation have negatively impacted habitat and wildlife. This has led to altered food webs, a loss of biodiversity, and poorly functioning ecosystems. Yet, opportunities for the protection and restoration of critical habitat exist throughout the basin.

While the Great Lakes region has been a leader for innovative science and advances in natural resource management, there are still significant gaps in knowledge about ecological processes and key indicators of ecosystem health. Efforts must be strategically chosen in order to collect the additional information needed to inform implementation activities, assist tracking and reporting of progress, and to identify adaptive management actions. The Great Lakes also face new and emerging problems such as the effects of climate change, including changing water levels, ice cover, and more frequent extreme rains.

Collectively, these problems have seriously compromised the environmental health of the Great Lakes. As a result, there is a new sense of urgency for action to address the highest priorities for restoring and protecting the Great Lakes. This document describes a strategic multi-year approach to address these urgent problems.

### **The Great Lakes Restoration Initiative and Action Plan**

The President's FY 2010 Budget included \$475 million for a new Great Lakes Restoration Initiative, strategically targeting programs and projects to address the most significant problems in the Great Lakes ecosystem and to demonstrate measurable results. EPA, in concert with its federal partners on the Great Lakes Interagency Task Force,<sup>1</sup> and other stakeholders, is leading the development and implementation of this Initiative. Building upon the extensive planning and collaboration that was done by the Great Lakes Interagency Task Force and a wide variety of stakeholders and non-governmental partners in development of the 2005 Great Lakes Restoration Strategy to Restore and Protect the Great Lakes (the GLRC Strategy), the Task Force developed a plan for FY2010.<sup>2</sup> Federal agencies will begin implementation of that FY 2010 plan upon appropriation of funding by Congress.

This Great Lakes Restoration Multi-year Action Plan Outline (Outline) advances implementation of the GLRI through FY2014 and will help protect and restore the chemical, physical, and biological integrity of the Great Lakes Basin ecosystem. It includes many elements of the GLRC Strategy and draws upon the ecological priorities, goals, and objectives of Lakewide Management Plans and Remedial Action Plans for Areas of Concern, as well as other relevant national and regional coordinated strategic planning efforts including the Comprehensive Management Plan for St. Clair River and Lake St. Clair, State Wildlife Action Plans, the Fish and Wildlife Service (FWS) National Fish Habitat Action Plan, A Joint Strategic Plan for Management of Great Lakes Fisheries, the U.S.-Canada Great Lakes Fishery Convention, Partners in Flight North American Landbird Conservation Plans, North American Waterbird Conservation Plan, North American Waterfowl Management Plan, U.S. Shorebird Conservation Plan, Great Lakes Coastal Wetland Monitoring Plan, Great Lakes Fishery Plan, and Endangered

---

<sup>1</sup> The Interagency Task Force includes eleven agency and cabinet organizations: EPA, State, Interior, Agriculture, Commerce, Housing and Urban Development, Transportation, Homeland Security, Army, Council on Environmental Quality, and Health and Human Services.

<sup>2</sup> That FY 2010 plan, together with documents describing Agency actions thereunder and the programs and projects to carry it out, are posted to <http://www.epa.gov/glnpo/glri/index.html>

Species Recovery Plans. This Action Plan takes a step toward integrating and aligning these and other Great Lakes Restoration and Protection plans, including individual states' Great Lakes protection plans. When completed, this Action Plan is thus intended to represent a broad consensus of the full Great Lakes community's strong commitment to significantly advance Great Lakes protection and restoration. There has been a broad base of support in the Great Lakes community for this and for past strategic planning efforts. EPA expects that stakeholders will be able to continue providing input to federal agencies for implementation of priority Great Lakes actions by participating in the planning efforts referenced above.

Five principal Focus Areas have been identified which encompass the most significant environmental problems in the Great Lakes (other than water infrastructure) for which urgent action is required. These five Focus Areas for Great Lakes protection and restoration are:

- Toxic Substances and Areas of Concern
- Invasive Species
- Nearshore Health and Nonpoint Source Pollution
- Habitat and Wildlife Protection and Restoration
- Accountability, Monitoring, Evaluation, Communication, and Partnerships

#### *High Priority Basinwide and Localized Issues*

Within the five Focus Areas, EPA will address the highest priority projects. It is EPA's intent to target efforts and funds to these high priority projects in a way that maximizes results. EPA believes that targeted, cooperative efforts are necessary to ensure meaningful progress on many of the complex and costly issues that have plagued the Great Lakes for decades. These issues are both basinwide (e.g., zebra mussels, nonpoint source pollution, lake sturgeon) and more localized (e.g., AOCs, critical habitats). Because of the Administration's historic commitment to the Great Lakes, we now have an unprecedented opportunity to systematically tackle these persistent issues. **EPA welcomes comment on what it should consider the highest priority basinwide and localized issues in each focus area, and also on how to address these issues to maximize results. The final Action Plan will include a discussion of the highest priority basinwide and localized issues, and how EPA plans to tackle them.**

#### *Goals, Objectives, and Targets*

Each Focus Area in this Action Plan includes a problem statement, goals, interim objectives, measures of progress and targets, the principal actions in support of the objectives, and Agency-specific actions. Federal Agencies will principally use existing staff and will minimize overhead in carrying out the Action Plan. EPA will assure that the goals, objectives, and targets of the Initiative are aligned with those of the Great Lakes States, and local and Tribal governments.

There are parts of this Great Lakes Multi-year Restoration Action Plan Outline for which the proposed goals, objectives, measures, baselines, and targets are fairly well developed, and others requiring additional work and greater specificity. We seek feedback to ensure we are tracking the right activities, setting appropriately ambitious goals, and measuring them correctly.

#### *Using the Best Available Science*

Before it is implemented, EPA will review the Action Plan to determine whether it can reasonably be expected to achieve its goals and objectives. EPA also plans to include review by

independent scientific panels for some elements and activities to ensure the best available science guides efforts. These panels will establish the scientific credibility for such elements before they are implemented, thus ensuring that programs and projects will advance progress toward achieving the goals, objectives, and restoration priorities of the Action Plan.

### *Project Selection*

The following criteria and principles will guide selection of programs<sup>3</sup> and projects pursuant to this Action Plan:

- Ability to strategically achieve measurable environmental outcomes linked to the highest priority issues;
- Ability to advance applicable ecological priorities of Lakewide Management Plans, Remedial Action Plans for Areas of Concern, as well as other relevant national and regional coordinated strategic planning efforts<sup>4</sup>;
- Feasibility of prompt implementation, including a bias for projects that are both ready-to-go and will have results soon (however, some funding will be used for planning and design to ensure cost effective implementation and for monitoring, particularly where it is needed to establish baseline conditions and/or to better understand environmental problems to inform implementation actions);
- Observable local impacts, especially for projects at the field level;
- Strong bias for inter-agency/inter-organizational coordination and collaboration;
- Support new work, or enhance (but do not replace) existing Great Lakes base activities;
- Public support;
- Ability to leverage non-Federal resources;
- Promotion of long-term societal, economic, and environmental sustainability; and
- Minimization of transaction costs.

Projects and Activities must also meet standards for:

- Best available science;
- Experience, ability, and authority of the funding recipient to properly perform the work;
- Reasonableness of project costs; and
- Measuring progress and success.

The Great Lakes Interagency Task Force used the criteria above to develop the Focus Areas of the initiative, evaluate programs and projects, and create provisional funding allocations.

Work within each Focus Area will be accomplished through federal interagency cooperation, and by working closely with States, Tribes, local government, academia, NGOs, and other

---

<sup>3</sup> Note that these funds will not be directed toward water infrastructure programs that are addressed under the Clean Water or Drinking Water State Revolving Fund program.

<sup>4</sup> Relevant priorities can be found in Lakewide Management Plans and Remedial Action Plans for Areas of Concern, as well as other relevant national and regional coordinated strategic planning efforts including State Wildlife Action Plans, the Fish and Wildlife Service (FWS) National Fish Habitat Action Plan, the Joint Strategic Plan for Management of Great Lakes Fisheries, the U.S.-Canada Great Lakes Fishery Convention, Partners in Flight North American Landbird Conservation Plans, North American Waterbird Conservation Plan, North American Waterfowl Management Plan, U.S. Shorebird Conservation Plan, Great Lakes Coastal Wetland Monitoring Plan, Great Lakes Fishery Plan, and Endangered Species Recovery Plans.

stakeholders in the Great Lakes basin, as well as our Canadian colleagues. As this Outline encompasses numerous national and regional coordinated strategic planning efforts and their associated plans (see footnote below), more detail on implementation is generally expected to be available from those other plans. Agencies anticipate maintaining their base levels<sup>5</sup> of Great Lakes activities; however, funding allocations are dependent upon actual appropriations.

### **Funding and Grants Cycle**

Through this Action Plan and collaboration among EPA and the other Agencies on the Great Lakes Interagency Task Force, and with input from Great Lakes stakeholders, the distribution of funds will be directed to maximize Great Lakes restoration and protection.

In order to be positioned to fund projects through grants<sup>6</sup> as soon as possible after an appropriation is made, EPA proposes to collaborate with the Great Lakes Interagency Task Force member agencies to do as much up-front work as possible, including issuance of an anticipatory Request for Proposals prior to the beginning of a fiscal year, before an appropriation has been made. The planning process assumes that an appropriation for grant funding for States, Tribes, local governments, and other organizations can be available early in each fiscal year.

Most EPA grants will be issued competitively pursuant to Requests for Proposals addressing the five identified Focus Areas<sup>7</sup>. These expressions of needed work are included in Lakewide Management Plans, Remedial Action Plans, fisheries management plans, biodiversity plans, waterfowl management plans, threatened and endangered species recovery plans, reports published by the International Joint Commission, and the GLRC Strategy. Should significant problems and issues need to be addressed outside of the five Focus Areas, a competitive grant program would be used to fill gaps, cut across, or overlap focus areas, address unanticipated areas, or facilitate innovation. Threshold criteria for grant selection will include a demonstration of the ability to commence work expeditiously and demonstrate the connection of the project to Great Lakes priorities. Grant selection criteria for all grants will include such factors as were identified previously for federal funding.

Following appropriation, EPA would act upon the recommendations and would select proposals and issue grants for EPA programs. Upon routine implementation of the Great Lakes Restoration Initiative program, EPA believes that if it were to receive an appropriation by October 1, of a given fiscal year, the first grants could be issued as early as December, with other grants issued throughout the course of the year.

Several other members of the Interagency Task Force are also expected to select proposals, issue grants, and provide other assistance with funding from the Great Lakes Restoration Initiative.

---

<sup>5</sup> As a starting point for identifying their base, Agencies were asked to use the 2009 OMB Great Lakes Restoration Crosscut Report to Congress.

<sup>6</sup> The term “grants,” as used in this document, includes both grants and cooperative agreements.

<sup>7</sup> The five Focus Areas identified initially for the Plan largely capture the environmental priorities expressed by the Great Lakes community in recent years. These expressions of needed work are included in Lakewide Management Plans, Remedial Action Plans, fisheries management plans, biodiversity plans, waterfowl management plans, endangered species plans, reports published by the International Joint Commission, and the 2005 Great Lakes Regional Collaboration Strategy.

Each member would provide assistance following its own applicable procedures, but would require special Great Lakes Restoration Initiative reporting provisions. To assist Great Lakes stakeholders in finding assistance opportunities pursuant to the Initiative in a single location, EPA will develop and update an interagency guide to all proposed funding under the Great Lakes Restoration Initiative.

Grant issuing agencies will ensure that appropriate results and accountability information is incorporated into public reports and provided to oversight groups.

### **Tracking Progress**

EPA will work with the Interagency Task Force to routinely track, measure, and report progress pursuant to the Great Lakes Restoration Initiative. Recipients of Great Lakes Restoration Initiative funding will be required to provide semi-annual reports on progress on their individual projects as well as progress toward the goals and interim objectives of the Initiative. EPA will collect that information and report on overall progress toward attaining the goals and interim objectives of the Initiative. EPA will work with the Interagency Task Force to identify needs for scientific research to target restoration priorities and adapt and modify activities in future years. Those needs and priorities will be included in the development of funding plans for subsequent years.

### **Annual Reports**

Beginning in 2011, EPA will work with its Great Lakes Interagency Task Force partners to prepare and submit an Annual Report to the President on progress in achieving the Great Lakes Restoration Initiative's environmental outcomes and measures. EPA will also report final funding allocation decisions each year to EPA's Congressional Appropriations Committees.

## **FOCUS AREA PROBLEMS, GOALS AND MEASURES OF PROGRESS**

### **I. Toxic Substances and Areas of Concern**

#### **Problem Statement**

While certain persistent toxic substances (PTS) have been significantly reduced in the Great Lakes Basin Ecosystem over the past 30 years, they continue to be present at levels above those considered safe for humans and wildlife, warranting fish consumption advisories in all five Lakes and Connecting Channels. Indigenous communities that still live off the land in the basin are particularly at risk from fish contamination. Continuing sources of persistent toxic substances include releases from contaminated sediments; industrial and municipal point sources; nonpoint sources including atmospheric deposition, agricultural and urban runoff, and contaminated groundwater; and cycling of the chemicals within the Lakes. Efforts to restore the degraded conditions in the 30 US Great Lakes Areas of Concern (AOCs) are underway, but much more needs to be done, including the remediation of an estimated 43 million cubic yards of contaminated sediments which are the main cause of beneficial use impairments in virtually all the AOCs.

In addition to the well-known persistent toxics like polychlorinated biphenyls (PCBs), mercury and banned pesticides, there are chemicals of emerging concern that have been detected in the Great Lakes over the past several years which may pose threats to the health of the ecosystem. Some such chemicals are found in pharmaceuticals and personal care products for which there is very little environmental information. To protect human and ecosystem health against future threats, these substances must be better understood with respect to their potential hazards and routes of exposure, with any necessary actions taken in a timely fashion.

#### **Proposed Long Term Goals**

- Goal 1: The discharge of toxic substances in toxic amounts is prevented and the discharge of any or all persistent toxic substances to the Great Lakes basin ecosystem is virtually eliminated.
- Goal 2: Exposure to toxic substances from historically contaminated sources is significantly reduced through source reduction and other exposure reduction methods.
- Goal 3: Environmental levels of toxic chemicals are reduced to the point that all restrictions on the consumption of Great Lakes fish can be lifted.
- Goal 4: The health and integrity of wildlife populations and habitat is protected from adverse chemical and biological effects associated with the presence of toxic substances in the Great Lake Basin.
- Goal 5: Areas of Concern are cleaned up, restoring the areas and removing the beneficial use impairments.

#### **Interim Objectives:**

- By 2014, delist x Areas of Concern.

- By 2014, x Beneficial Use Impairments will be restored in Areas of Concern.
- By 2014, 7 million cubic yards of contaminated sediments will be remediated.
- Through 2014, an average annual 5 percent annual decline will be maintained or improved for the trend (year 2000 and on) in average concentrations of PCBs in whole lake trout and walleye samples.
- Through 2014, an average 7 percent annual decline will be maintained or improved for the long term trend in average concentrations of PCBs in the air in the Great Lakes basin.
- By 2014, 50 million pounds e-waste, 50 million pills unwanted medicines, and 5 million pounds of household hazardous waste in the Great Lakes basin will have been collected or its release will have been prevented.

### Measures of Progress

The Great Lakes Restoration Initiative will significantly accelerate pollution prevention and reduction in the Great Lakes ecosystem. The measures by which progress will be evaluated in this Focus Area are:

Measure	Baseline(B)/ Universe(U)	2010 Target	2011 Target	2014 Target
Number of Areas of Concern in the Great Lakes which are restored and delisted (cumulative). <sup>8</sup>	B: 1 U: 31	3		
AOC beneficial use impairments removed (cumulative). <sup>9</sup>	B: 11 U: 261	16		
Cubic yards (in millions) of contaminated sediment remediated in the Great Lakes (cumulative). <sup>10</sup>	B: 5.5 million (2007 ) U: 46 million	6.25 million	6.45 million	7 million
Pollution (in pounds) collected through prevention and waste minimization projects in the Great Lakes basin (cumulative).	B: 0 U: unknown	10 million	20 million	50 million
Annual percentage decline for the long term trend in average concentrations of PCBs in Great Lakes fish. <sup>11</sup>	B: Concentrations at US stations in L SU [0.71 ppm], MI [1.5 ppm], HU [.78 ppm], ER [1.2 ppm] and ON [1.2 ppm]. <sup>12</sup>	Annual 5% decline	Annual 5% decline	Annual 5% decline

<sup>8</sup> Existing GPRA measure.

<sup>9</sup> Existing GPRA measure.

<sup>10</sup> Existing GPRA measure.

Annual percentage decline for the long term trend in average concentrations of PCBs in atmospheric deposition to the Great Lakes. <sup>13</sup>	B:Concentrations at stations in: L. SU [100 pg/m3], MI [289 pg/m3], and ER [431 pg/m3]. <sup>14</sup>	Annual 7% decline	Annual 7% decline	Annual 7% decline
---	---	-------------------	-------------------	-------------------

**Principal Actions to Achieve Progress**

The principal Great Lakes Restoration Initiative actions for FY 2010 to 2014 to protect the Great Lakes from toxic substances, clean up sediments, and restore Areas of Concern include:

- *Restore Areas of Concern/Remediate Contaminated Sediments* – Accelerate the rate of sediment clean-up in AOCs throughout the Great Lakes basin through programs such as the Great Lakes Legacy Act, Water Resources Development Act, and Natural Resource Damage Assessment. Restore and delist AOCs through strategic actions identified in Remedial Action Plans to restore individual beneficial uses.
- *Strategic Pollution Prevention and Reduction Projects* – Prevent toxic pollutants from entering the Great Lakes through a variety of strategic actions, working closely with State, tribal and local governments. Initiate new Clean Sweep and collection programs in the Great Lakes basin to promote the safe disposal and elimination of toxic and other substances, including pesticides, pharmaceuticals, and other waste stream pollutants that can cause impairments.
- *Protect Human Health through Safer Fish Consumption* – Continue to protect Great Lakes fish consumers with sound and sensible advice provided through robust State and tribal fish advisory programs. Work closely with the Great Lakes medical and health communities to educate the general public regarding the benefits and risks of Great Lakes fish consumption.
- *Measuring Progress and Assessing New Toxic Threats* – Measure progress in cleaning up toxics in the Great Lakes environment through comprehensive monitoring and assessment. Identify significant sources and impacts of new toxics to the Great Lakes ecosystem through robust surveillance as well as laboratory and field studies, in order to devise and implement effective control strategies.

**II. Invasive Species**

**Problem Statement**

---

<sup>11</sup> Existing GPRA measure.  
<sup>12</sup> 2000 Baseline.  
<sup>13</sup> Existing GPRA measure.  
<sup>14</sup> 1992 Baseline.

Progress toward restoring the Great Lakes has been significantly undermined by the effects of non-native invasive species. Over 180 non-native species now exist in the Great Lakes. The most invasive of these propagate and spread, ultimately degrading habitat, out-competing native species, and short-circuiting food webs. Prevention is the most cost-effective approach to dealing with organisms that have not arrived and could potentially threaten the lakes. New invasive species can be introduced into the Great Lakes region through various pathways, including: commercial shipping, canals and waterways, trade of live organisms, and activities of recreational and resource users. Once invasive species establish a foothold in the Great Lakes, they are virtually impossible to eradicate; however, invasive species still need to be controlled to maintain the health of the Great Lakes ecosystem. Advanced technology and innovative management practices can significantly reduce the cost of control.

Prevention and control efforts must be accelerated in order to prevent new introductions and to minimize the further spread of the organisms to inland lakes, the Mississippi River watershed, and beyond. Federal Agencies will need to work with their partners in state, tribal, and local governments, academic institutions, industry, and non-governmental organizations to:

1. Stop the introduction of new non-native invasive species into the Great Lakes through enhanced prevention programs.
2. Control and reduce the spread of invasive species already here, through innovative technology and enhanced on-the-ground efforts.
3. Establish early detection and rapid response capabilities to deal with accidental introductions.

### **Proposed Long Term Goals**

- Goal 1: The introduction of all Invasive Species to the Great Lakes basin ecosystem via ballast water is virtually eliminated.
- Goal 2: The risk of introduction of species, which are imported for various uses, into the Great Lakes is minimized.
- Goal 3: The spread of Invasive Species, by means of recreational activities and canals and waterways, beyond their current range is prevented.
- Goal 4: A comprehensive program for detection of newly established Invasive Species into the Great Lakes is developed that will provide information to decision makers, who will initiate rapid response actions when appropriate.
- Goal 5: An effective, efficient, and environmentally sound program of integrated pest management for priority Invasive Species is developed and implemented, including program functions of containment, eradication, control, and mitigation.

### **Interim Objectives:**

- By 20xx, achieve a xx% reduction in the rate of nonnative species newly detected in the Great Lakes ecosystem.
- By 20xx, invasive species populations within the Great lakes Ecosystem will have been controlled and reduced, as measured in populations controlled to a target level, area managed, or amount of species removed.
- By 20xx, surveillance of Great Lakes ecosystem will increase, as measured by number of sampling locations in which surveys are conducted using coordinated monitoring plans and shared protocols.
- By 20xx, rapid response capabilities will be increased, as demonstrated by either multi-agency rapid response plans implemented, mock exercises to practice responses carried out under those plans, and/or actual response actions.
- By 20xx, technology that prevents the introduction of invasive species will be developed or refined and piloted.
- By 20xx, technology that either contains or controls invasive species in an effective, efficient, and environmentally sound manner will be developed or refined and piloted.
- By 20xx, pilot projects that demonstrate innovative prevention, containment, or control measures will be implemented.
- By 20xx, recreation and resource users will be educated on best practices that prevent the introduction and spread of invasive species.

### Measures of Progress

The Great Lakes Restoration Initiative will significantly advance efforts to prevent new introductions of non-native invasive species in the Great Lakes basin and to stop the further spread of invasives in the Great Lakes basin. Great Lakes Interagency Task Force agencies will work to further develop the initial set of measures by which progress will be evaluated in this Focus Area. The measures by which progress will be evaluated in this Focus Area are:

Measure	Baseline/ Universe	2010 Target	2011 Target	2014 Target
Number of nonnative species newly detected in the Great Lakes ecosystem as reported in agency reports or peer-review journal articles during the previous year.	B: TBD U: TBD			
Acres managed or amount of species removed for populations of invasive species controlled to a target level. (cumulative)	B: TBD U: TBD			
Number of sampling locations in which surveys are conducted, using coordinated monitoring plans and shared protocols. (cumulative)	B: TBD U: TBD			
Number multi-agency rapid response plans implemented, mock exercises to practice responses carried out under those plans, and/or actual response actions. (cumulative)	B: TBD U: TBD			

Number of developed or refined and piloted technologies that prevents, contains, or controls the introduction of invasive species. (cumulative)	B: TBD U: TBD			
Number of pilot projects that demonstrate innovative prevention, containment, or control measures. (cumulative)	B: TBD U: TBD			
Number of recreation and resource users contacted on best practices that prevent the introduction and spread of invasive species. (cumulative)	B: TBD U: TBD			

**Principal Actions to Achieve Progress**

The principal Great Lakes Restoration Initiative actions for FY 2010 to 2014 to prevent new introductions of non-native invasive species in the Great Lakes basin and stop the further spread of invasives in the Great Lakes basin include:

- *Develop Ballast Water Treatment that Protects Freshwater Ecosystems* - Develop a coordinated approach to the development of ballast water treatment suitable for fresh water ecosystems, though the use of laboratory, land-based, and ship-board testing, verification of treatment technologies, and coordination with the maritime industry. Support work to reduce ship-mediated introductions through hull and anchor chain fouling.
- *Implement Early Actions to Address Water Pathways Vectors* – Strategically identify key waterways which could introduce invasive species to the Great Lakes and implement actions such as barriers to reduce this risk. Existing canals and extreme storm events can form hydrological connections which may introduce invasive species into the Great Lakes. Models and analysis of hydrological connections under different weather conditions are needed to identify and minimize risks of such barrier bypasses.
- *Prevention by Broad Stakeholder Outreach and Education* – Promote actions, including coordinated education and outreach, which will prevent the introduction and spread of invasive species through recreational uses such as hunting, fishing and recreational boating. Use of best practices will ensure the sustainable use of the resource.
- *Develop and Demonstrate Innovative Control Technology* – Promote the development and use of new control technologies which will significantly reduce the cost and/or increase the effectiveness of invasive species control measures.
- *Support States Role in Invasive Species Prevention and Control* - Support the development and on-the-ground implementation of Aquatic Nuisance Species Management Plans for each Great Lake state.
- *Control Key Invasive Species and Investigate Causal Mechanisms by which Invasives impact Native Species* – Develop a better understanding and models of ecosystem

interactions and management options for minimizing the impact of invasives, including new treatment or control methods.

- *Establish Early Detection and Rapid Response Capability* - Work with federal and state jurisdictions to initiate surveillance activities to detect new invaders and establish the capacity, methods, and contingency plans for a rapid response. Joint planning will allow the mobilization of shared resources to create the best opportunity for eradication

### **III. Nearshore Health and Nonpoint Source Pollution**

#### **Problem Statement**

The nearshore environment includes both aquatic and terrestrial features which extend variable distances away from the land-water intersection. This is the area in which most residents and visitors interact with the Great Lakes. The nearshore waters of the Great Lakes are a primary source of drinking water, supplier of fish for both personal and commercial benefit, and a recreational outlet for millions of U.S. residents and visitors. Nearshore water quality has become degraded, as evidenced by eutrophication resulting from excessive nutrients; harmful algal blooms; *Cladophora* washing ashore to make unsightly, odiferous rotting mats on beaches; avian botulism; and beach closings. The environmental stressors causing these problems include excessive nutrient loadings from both point and nonpoint sources; bacteria and other pathogens responsible for outbreaks of botulism and beach closures; development and shoreline hardening which disrupt habitat and alter nutrient and contaminant runoff; and agricultural practices which increase nutrient and sediment loadings. Additional shoreline stresses can be traced to failing septic systems, grey water pipes, and inadequate pump-out stations for recreational boats.

Many of the point sources of pollution to the Great Lakes have been controlled. Nonpoint sources are now the primary contributors of many pollutants to the Lakes and their tributaries. Although some nonpoint sources act on a whole-basin scale, e.g., atmospheric deposition of toxic substances, many smaller scale sources contribute to degraded water quality in Great Lakes tributaries and nearshore waters. The complexity of the pollutants and their presence in soil, water and air make pollution abatement for nonpoint sources particularly difficult to address. Control strategies to date have failed to deliver the degree of stream and lake restoration necessary for the protection and maintenance of the Great Lakes.

#### **Proposed Long Term Goals**

- Goal 1: Nearshore aquatic communities consist of healthy, self-sustaining plant and animal populations dominated by native species.
- Goal 2: Land use, recreation and economic activities are managed to ensure that nearshore aquatic, wetland and upland habitats will sustain the health and function of natural communities.
- Goal 3: The presence of bacteria, viruses, pathogens, nuisance growths of plants or animals, objectionable taste or odors, or other risks to human health are reduced to levels that do not impede human use and enjoyment of the nearshore areas.

- Goal 4: High quality bathing beach opportunities are maintained by eliminating impairments from bacterial, algal, and chemical contamination; effective monitoring for pathogens; effective modeling of environmental conditions, where appropriate; and timely communications to the public about beach health and daily swimming conditions.
- Achieve a significant reduction in soil erosion and the loading of sediments into tributaries through greater implementation of soil conservation practices in agriculture, forestry, and urban areas.
- Goal 5: High quality, timely, and relevant information about the nearshore areas is readily available to assess progress and to inform enlightened decision-making.

**Interim Objectives:**

- By the end of 2009 (CY), EPA will compile and map the highest priority watersheds for implementation of targeted nonpoint source pollution control measures.
- By 2014, remediation, restoration and conservation actions in xxx priority watersheds in each Great Lake basin will control erosion, reduce nutrient runoff from urban and agricultural sources, and improve habitat to protect nearshore aquatic resources.
- By 2014, a baseline will be established for total suspended solids loadings from targeted tributaries .
- By 2014, a xx% decrease will be achieved in soluble phosphorus loading from 2008 levels in targeted tributaries.
- By 2014, the causes of nutrient-related nearshore biological impairments will be understood, and following local remedial actions, the number and severity of incidences of harmful algal blooms, avian botulism, and/or excessive *Cladophora* growth will be significantly reduced from 2008 levels.
- By 2014, a comprehensive nearshore monitoring program will have been established and implemented, including a publicly-accessible reporting system, based on a suite of environmental indicators.
- By 2014, [50% of] [90% of high priority<sup>15</sup>] Great Lakes beaches will have been assessed using a standardized sanitary survey tool to identify sources of contamination.
- By 2014, [25% of] [50% of high priority] Great Lakes beaches will have begun to implement measures to control, manage or remediate pollution sources identified through the use of sanitary surveys.

---

<sup>15</sup> Beaches states identify as most frequently used and/or that have the highest risk. There were 356 high priority beaches (in 2008) out of a total of 1,411 total beaches in the US Great Lakes.

- By 2014, rapid testing or predictive modeling methods (to improve the accuracy of decisions on beach postings to better protect public health) will be employed at xx% of high priority beaches.
- By 20xx, the percentage of agricultural lands in conservation and/or utilizing conservation tillage practices will increase by xx%.

### Measures of Progress

The Great Lakes Restoration Initiative will significantly improve the health of Great Lakes nearshore areas and will advance the reduction of nonpoint source pollution to levels that do not impair nearshore waters. The measures by which progress will be evaluated in this Focus Area are:

Measure	Baseline(B)/ Universe(U)	2010 Target	2011 Target	2014 Target
Annual total phosphorus loadings to each Great Lake	B: U:			GLWQA Targets
Percentage of beaches meeting bacteria standards 95% or more of beach days.	B: U:			
Extent and severity of Great Lakes Harmful Algal Blooms.*	B: U:			
Miles of Great Lakes coastline negatively impacted by <i>Cladophora</i> growth.*	B: U:			
Rate of sediment deposition in certain harbors (measured by USACE for dredging purposes).	B: U:			
Acres subscribed in conservation programs managed by NRCS.	B: U:			

\*Biological responses to nutrients loadings are also dependent on other factors such as water temperature, timing and intensity of precipitation, and hydrologic features. Year-to-year variability in these features may mask local improvements in nutrients management.

### Principal Actions to Achieve Progress

The principal Great Lakes Restoration Initiative actions for FY 2010 to 2014 to improve the health of Great Lakes nearshore areas and reduce nonpoint source pollution to levels that do not impair nearshore Great Lakes waters include:

- *Place-Based Watershed Implementation.* Significant progress has been made nationally and in the Great Lakes basin in addressing soil erosion and in reducing nutrient or other contaminant loads to tributaries to the Great Lakes through the existing state and Federal programs. However water quality problems still exist, loadings of sediment and nutrients are still unacceptably high in a number of areas, and degraded watershed conditions have been linked to impaired nearshore biological communities. This results in increased costs for navigation dredging of harbors, and in localized environmental problems such as mats of rotting algae on swimming beaches and along the shore. GLRI efforts in this area will

address high priority watersheds, performing scientific analyses to strategically target where on-the-ground actions can be most effective, and providing supplemental funding to implement those actions. This will involve close collaboration between state programs, NRCS, the Corps of Engineers, USFWS, USGS and EPA.

- *Identify sources and reduce loadings of nutrients and soil erosion.* These activities will contribute to the reduction or elimination of the number and severity of incidences of ecosystem disruptions, including *Cladophora*, harmful algal blooms (HABs), botulism, and other issues associated with eutrophication. Activities will include: applying research and modeling to prevent incidences of *Cladophora*, HABs and botulism; enhancing or implementing watershed practices to reduce export of nutrients and soils to the nearshore waters; and establishing and implementing total maximum daily loads (TMDLs) for phosphorus, scaled from river reaches to watersheds to the whole Great Lakes basin.
- *Improve Public Health Protection at Beaches.* Humans are put at risk when exposed to pathogenic bacteria. These activities will reduce risk to human health at swimming beaches by reducing the abundance of pathogenic organisms to levels below established criteria, increasing the effectiveness of monitoring for pathogens, modeling environmental conditions likely to result in elevated levels of bacteria, or enhancing communications to the public about daily swimming conditions.
- *Generate Critical Information for Protecting Nearshore Health.* The nearshore environment of the Great Lakes is highly varied, including relatively unspoiled shorelines, highly urbanized reaches, tributary mouths, embayments, wetlands and other environmental features. These activities will promote the collection of data about nearshore conditions and stresses, the assessment of information and management implications, or the dissemination of information to all potential users in the Great Lakes community.

#### **IV. Habitat and Wildlife Protection and Restoration**

##### **Problem Statement**

The health of Great Lakes habitats and wildlife depends upon the protection and restoration of ecosystems: the Great Lakes, the coastline, wetlands, rivers, connecting channels, and watersheds. Humans benefit from healthy ecosystems. Healthy Great Lakes, for example, provide us with clean drinking water; rare wildlife populate a variety of unique coastline habitats; wetlands help control floodwaters; rivers transport sediments, nutrients and organic materials throughout the watershed; forests provide oxygen while reducing erosion and sedimentation; and, upland habitats produce topsoil and habitats for pollinators and bio-control agents. Fully resilient ecosystems buffer the impacts of climate change.

A multitude of threats affect the health of Great Lakes habitats and wildlife. Habitat destruction and degradation due to development; competition from invasive species; the alteration of natural lake level fluctuations due to artificial lake level management and flow regimes from dams, drain tiles, ditches, and other control structures; toxic compounds from urban development, poor land management practices and non-point sources; and, habitat fragmentation have impacted habitat and wildlife. This has led to an altered food web, a loss of biodiversity, and poorly functioning ecosystems.

**Proposed Long Term Goals**

- Goal 1: Protection and restoration of Great Lakes aquatic and terrestrial habitats, including physical, chemical, and biological processes and ecosystem functions, maintains or improves the conditions of native fish and wildlife.
- Goal 2: Critical management activities (such as stocking native fish and other aquatic species, restoring access of migratory fish species at fish passage barriers, and identifying and addressing diseases) protect and conserve important fish and wildlife populations.
- Goal 3: Sound decision-making is facilitated by accessible, site specific and landscape-scale baseline status and trend information about fish and wildlife resources and their habitats.
- Goal 4: High priority actions identified in strategic plans (such as species management, restoration and recovery plans, Lakewide Management Plans, Remedial Action Plans, and others) are implemented, lead to the achievement of plan goals, and reduce the loss of fish and wildlife and their habitats.

**Interim Objectives:**

- By 2014, 3,000 miles of Great Lakes rivers and tributaries will be reopened and 500 barriers to fish passage will be removed or bypassed.
- By 2014, 75,000 acres of wetlands, wetland-associated uplands, and high priority coastal, upland, and island habitats will be protected, restored, or enhanced.
- By 2014, 8 million lake trout and lake sturgeon, and other native species will be propagated.
- By 2014, xx% of threatened and endangered species will be stabilized or improved.
- By 2014, xx% of populations of native aquatic non-threatened and endangered species exist at self sustaining levels.

- By 2014, data will be collected on the health of 2,000 coastal wetlands and 500 critical spawning areas.
- By 2014, 30% of habitat-related beneficial use impairments will be delisted across 27 Areas of Concern.

### Measures of Progress

The Great Lakes Restoration Initiative will significantly accelerate Great Lakes habitat and wildlife protection. The measures by which progress will be evaluated in this Focus Area are:

<b>Measure*</b>	<b>Baseline (B) /Universe (U)</b>	<b>2010 Target</b>	<b>2011 Target</b>	<b>2014 Target</b>
Miles of rivers reopened for fish passage.	B: Unknown U: Unknown	1,000 miles	2,000 miles	3,000 miles
Number of fish passage barriers removed or bypassed.	B: Unknown U: Unknown	100 barriers	200 barriers	500 barriers
Number of lake trout, lake sturgeon, and other native species propagated.	B: Unknown U: Unknown	1 million	2 million	8 million
Number of management plans implemented (recovery, fisheries, etc.)	B: Unknown U: Unknown	2	4	10
% of populations of native aquatic non-T&E species that are self-sustaining in the wild.	B: Unknown U: Unknown	9**		
% of habitat needs met to achieve healthy and sustainable levels of migratory birds.	B: Unknown U: Unknown			
Number of cooperative agreements initiated (landowner agreements, grants, etc.).	B: Unknown U: Unknown	500		
% of threatened and endangered species that are stabilized or improved.	B: Unknown U: Unknown			
Number of acres of wetlands, wetland-associated uplands, and coastal, upland, and island habitats restored.	B: Unknown U: 1,550,000 acres	15,000 acres	30,000 acres	75,000 acres
Data collected for the number of coastal wetlands.	B: 0 U: Data collected for 7,500 coastal wetlands (polygons)	400 coastal wetlands (polygons)	800 coastal wetlands (polygons)	2,000 coastal wetland (polygons)
Percentage of Habitat-related beneficial use impairments removed from the 27 US Areas of Concern so impaired.	B: 0 U: 100% of the 74 so impaired	5%	10%	30%

\* Out year targets for these measures are cumulative. The Universe represents all that is possible to protect, restore, enhance; baseline represents the number of acres etc. that are already protected, restored, enhanced.

\*\*Great Lakes Restoration Initiative funding would promote +9 populations (lake trout/sturgeon) to self-sustaining levels.

### **Principal Actions to Achieve Progress**

The principal Great Lakes Restoration Initiative actions for FY 2010 to 2014 to protect and restore Great Lakes habitat and wildlife include the following. Agencies will work together with states, tribes, municipalities, non-governmental organizations and industry to:

- *Improve Aquatic Ecosystem Resiliency* – Protect and restore aquatic habitats for fish and wildlife populations, so they are able to withstand future stressors such as extreme weather events expected from changes in climate, by reconnecting habitats, reducing sediment and nutrient inputs, restoring natural hydrological processes, improving water quality, restoring ecosystem services, and increasing populations of native fish and wildlife through coordinated management actions.
- *Maintain or Improve the Population Status of Threatened, Endangered, Rare and Migratory Species* – Enhance native species populations by implementing restoration actions identified in species recovery and management plans, quantifying habitat needs for depleted migratory bird species, propagating lake trout and lake sturgeon fingerlings, assessing fish populations, and protecting and restoring culturally significant species.
- *Enhance Wetlands, Wetland-Associated Uplands, and High Priority Coastal, Upland and Island Habitats* – Protect, restore, or enhance habitats by restoring natural hydrological regimes, improving water quality, and restoring the chemical, physical, and biological integrity of ecosystems in each Great Lake basin.
- *Identify, Inventory, and Track Progress on Great Lakes Habitats, Including Coastal Wetlands Restoration* - Assess progress toward restoring Great Lakes habitats by establishing baseline conditions and tracking trends; highlight the importance of coastal wetland conservation and restoration by implementing a long-term coastal wetland monitoring program and enhancing the National Wetlands Inventory.
- *Restore Habitat Functioning in Areas of Concern* – Improve habitats in Areas of Concern where beneficial use impairments limit ecosystem functioning by restoring habitats for native species populations and removing or isolating contaminants.

## **V. Accountability, Monitoring, Evaluation, Communication, and Partnerships**

### **Problem Statement**

The Great Lakes Restoration Initiative requires additional oversight and coordination to succeed. There are gaps in efforts to measure and monitor key indicators of ecosystem function, to evaluate restoration progress, and to provide the information decision-makers need. This

information needs to be based on best available science, and compiled and communicated consistently to decision-makers to allow them to assess ecosystem conditions and to track restoration progress. Outreach and education is also needed to educate the public on the role they can play in protecting and restoring the Great Lakes – and why it is crucial to do so. Information must also flow both ways – the governments need to hear from the stakeholders about priorities most critical to them and factor in these comments as appropriate.

The Great Lakes span many different government jurisdictions along with their regulatory agencies and authorities: two countries, eight U.S. states, two Canadian provinces, 83 U.S. counties, thousands of cities and towns, 33 U.S. tribal governments and over 60 recognized First Nations in Canada. Through the 1909 Boundary Waters Treaty with Canada, the related Great Lakes Water Quality Agreement, and a host of other institutional arrangements, this region has a long history of governments at all levels working in partnership to protect and restore the Great Lakes. Federal coordination efforts have been greatly improved through efforts of the Great Lakes Interagency Task Force and its Regional Working Group. Binational efforts continue through the Binational Executive Committee which oversees the U.S. and Canada's actions to implement the provisions of the Great Lakes Water Quality Agreement. These partnerships must continue and be further strengthened in order to address the complex issues faced by the Great Lakes. Effective public outreach and education strategies must be developed and implemented.

### **Proposed Long Term Goals**

- Goal 1: A cooperative monitoring and observing system provides a comprehensive assessment of the Great Lakes ecosystem.
- Goal 2: The necessary technology and programmatic infrastructure supports collaborative monitoring and reporting, including Great Lakes Restoration project data.
- Goal 3: Data and information are provided in reports that are public friendly, timely, and available on the internet. Reports present integrated and scaled data from watersheds to lakes to Great Lakes basin wide.
- Goal 4: Accessible mechanisms provide a range of opportunities for Great Lakes stakeholders and citizens to provide input to the governments on Great Lakes issues and concerns.
- Goal 5: Improved LaMP programs, processes, and plans are developed and implemented which reflect consensus views of all appropriate governmental partners and input from stakeholders and the public. Priority Lakewide Management Plan goals and objectives are achieved through implementation of critical projects and programs. Lake-specific goals, objectives and indicators are measured and tracked at multiple scales and through appropriate events.
- Goal 6: Under the Great Lakes Water Quality Agreement, restoration activities in the U.S. are coordinated with those of the Canadian and provincial governments.

**Interim Objectives:**

- By 2011, opportunities for collaboration, planning, data accessibility, and accountability will be increased through the expanded use of internet-based technology.
- By 2011, a transparent accountability system will be developed and implemented for the Great Lakes Restoration Initiative. The system will integrate and make transparent strategic planning, budgeting, and results monitoring.
- By 2011, a satellite remote sensing program will be implemented to assess Great Lakes productivity and biological (algal bloom) events.
- By 2011, a refined suite of science-based indicators for better assessment of Great Lakes ecosystem health will be identified and monitoring programs for those indicators will begin to be implemented.
- By 2014, more timely data and information will be provided to decision makers at multiple scales within a framework of established baselines, targets, indicators of progress, and monitoring.
- By 2014, a cooperative monitoring and observing system, sufficient to provide a comprehensive assessment of the Great Lakes ecosystem, will be established. The system will integrate remote sensing, automated sampling, and shipboard monitoring.

**Measures of Progress**

The Great Lakes Restoration Initiative will significantly improve collaborative Great Lakes decision making, transparency, and accountability for Great Lakes information. Representatives of the federal agencies below will work together to determine which existing agency inventory and monitoring data can be used to establish baselines for the various performance goals and to identify needed additional research and monitoring, outreach, and implementation. The measures by which progress will be evaluated in this Focus Area are:

Measure	Baseline(B)/ Universe(U)	2010 Target	2011 Target	2014 Target
Improvement in the overall aquatic ecosystem health of the Great Lakes using the Great Lakes 40-point scale. <sup>16</sup>	B: 20 U: 40			23.5
Number of remediation, restoration, or conservation LaMP priority actions are completed.	B:xx U:xx			20

<sup>16</sup> Existing GPRA Measure. The Great Lakes Index uses select Great Lakes ecosystem indicators (i.e., coastal wetlands, phosphorus concentrations, AOC sediment contamination, benthic health, fish tissue contamination, beach closures, drinking water quality, and air toxics deposition) and is based on a 1 to 5 rating system for each indicator, where 1 is poor and 5 is good. Improvements in the index and measures would indicate that fewer toxics are entering the food chain; ecosystem and human health is better protected; fish are safer to eat; water is safer to drink; and beaches are safer for swimming.

### **Principal Actions to Achieve Progress**

The principal Great Lakes Restoration Initiative actions for FY 2010 to 2014 to achieve significant, measurable objectives include:

- *Develop Great Lakes Restoration Accountability System*- Develop and implement a transparent accountability system for the Great Lakes Restoration Initiative, including easy access to information and linkages to planning, budgeting, and results. With and through the LaMPs, partner agencies will report out regularly on Initiative progress on the Great Lakes as a whole and on each of the Lakes and Connecting Channels, using public forums to assist with the transfer and dissemination of information to the public.
- *Measure and Evaluate the Health of the Great Lakes Ecosystem using the best available science* – Enhance existing programs that measure and assess the physical, biological, and chemical integrity of the Great Lakes, including the Connecting Channels. Implement strategic components relevant for Great Lakes decision-making of the U.S. contribution to the Integrated Earth Observation System and the Integrated Ocean Observing System as part of the Global Earth Observing System of Systems. Develop a federal strategy on the key scientific priorities needed to fully assess the impacts climate change may have on the health of the Great Lakes ecosystem and better manage those impacts. Promote the development and implementation of science-based indicators that will better assess and provide a better measure of accountability of actions to improve the health of the Great Lakes ecosystem.
- *Enhance Partnerships* – Enhance coordination and collaboration among Great Lakes partners to help ensure that actions, projects and programs under the Great Lakes Restoration Initiative are efficient, effective and in furtherance of the US- Canada Great Lakes Water Quality Agreement. Partnerships will be advanced and resources and capabilities leveraged through existing collaborative efforts such as the US-Canada Binational Executive Committee, the State of the Lakes Ecosystem Conference, the US-Canada Great Lakes Binational Toxics Strategy, Lakewide Management Plans, Four Agency Agreements, the Coordinated Science Monitoring Initiative and Great Lakes Fisheries management.