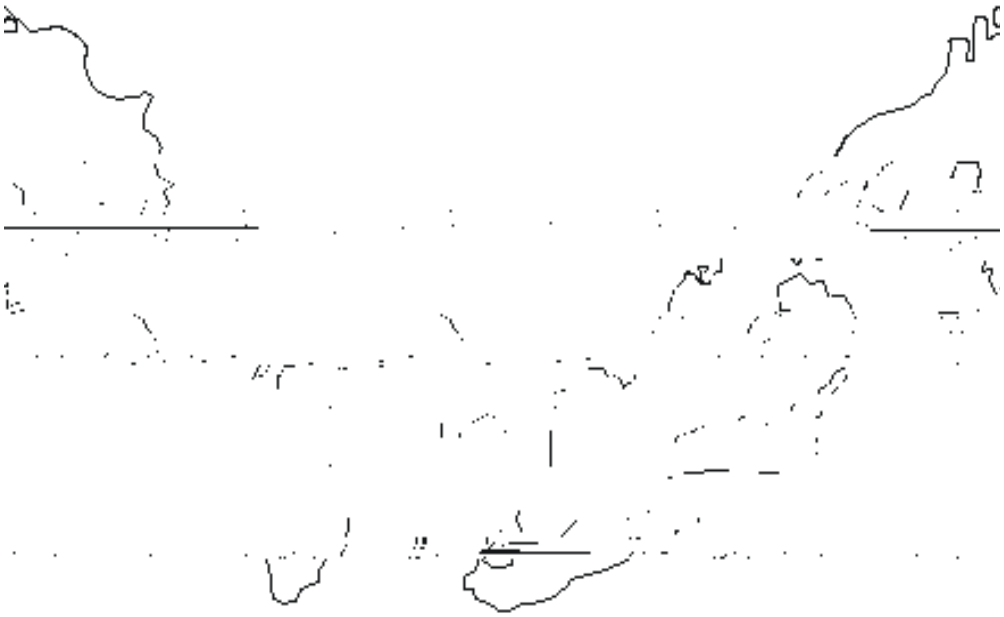

USPC

GREAT LAKES STRATEGY 2002 -A PLAN FOR THE NEW MILLENNIUM

A Strategic Plan for the Great Lakes Ecosystem

U.S. POLICY COMMITTEE PARTNERS:

U.S. Army Corps of Engineers - U.S. Environmental Protection Agency- U.S. Coast Guard
U.S. Department of Agriculture - National Oceanic and Atmospheric Administration
U.S. Fish and Wildlife Service - U. S. Geological Survey
Agency for Toxic Substances and Disease Registry - U.S. Forest Service
Great Lakes Fishery Commission
Illinois Indiana Michigan Minnesota New York Ohio Pennsylvania Wisconsin
Great Lakes Tribal Governments

RENEWING THE PARTNERSHIP

Since the signing of the 1972 Great Lakes Water Quality Agreement (GLWQA), programs and policies to restore and protect the Great Lakes have served as a worldwide model for inter-jurisdictional cooperative environmental protection and natural resource management. Toxic substances in the environment have been greatly reduced and the ecosystem shows signs of recovery. Billions of dollars in wastewater infrastructure improvements and bans on high phosphate household detergents have largely addressed the excess nutrient loads which choked the Great Lakes with nuisance algae. The treatment of industrial effluent discharges has greatly improved water quality. Multimedia initiatives to prevent pollution from persistent, toxic substances, have evolved to become a national program. Multi-stakeholder lake-wide and local stewardship initiatives are serving to identify and protect habitats which support an important variety of plants, fish, terrestrial wildlife, and other important species found in this world-class freshwater ecosystem. Despite these impressive accomplishments, much work remains to be done to ensure a healthy Great Lakes ecosystem.

Great Lakes Strategy 2002 (hereunder the "Strategy") was created by the U.S. Policy Committee (USPC) – a forum of senior-level representatives from the Federal, State, and Tribal governmental agencies that share responsibility for environmental protection and natural resources management of the Great Lakes – to advance the restoration and protection of the Great Lakes Basin Ecosystem. The purview of this Strategy is focused on U.S. Federal, State and Tribal government environmental protection and natural resource management activities as they relate to fulfilling the goals of the GLWQA[1]. Activities such as economic development, while related the goals of this Strategy, are not specifically addressed. This

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[1] The GLWQA, first signed by President Nixon and Prime Minister Trudeau in 1972, establishes a joint, binational commitment by the U.S. and Canada to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem.

The restoration and protection of the Great Lakes ecosystem is a massive undertaking. This international watershed includes two nations, eight U.S. States, a Canadian Province[2], more than forty Tribes and First Nations[3], and many local governments. Only through a cooperative partnership can we ensure its health. ***Great Lakes Strategy 2002*** will guide the efforts of the USPC for the next several years. Working with the broader Great Lakes community, the USPC looks forward to implementing this "Great Plan for the Great Lakes."

Why The Great Lakes Are Important Regionally, Nationally, And Globally

The Great Lakes basin is home to more than thirty million people. It is where many of us live, work, and play. The Great Lakes – deep fresh water seas – are the largest system of surface freshwater on the Earth, spanning about 800 miles and containing about 20% of the world's surface freshwater resource (5,500 cubic miles or about six quadrillion gallons of water). The water in the Great Lakes accounts for more than 90% of the surface freshwater in the U.S. In the U.S., the Great Lakes are considered a fourth seacoast. The total shoreline (U.S. and Canadian, including connecting channels and islands) is more than 10,000 miles, or about 40% of the earth's circumference.

The Great Lakes basin holds major urbanized areas that are home to more than one-tenth of the population of the U.S. and one-quarter of the population of Canada (a total of more than 33 million people). Over thirty million people in the U.S. and in Canada rely on the Great Lakes watershed as a source of drinking water.

The basin contains many thriving, ecologically rich areas. The Great Lakes ecosystem includes such diverse elements as northern evergreen forests, deciduous forests, tall grass and lake plain prairies, sandy barrens, alvars, dunes, and coastal wetlands. Over thirty of the basin's biological communities and over 100 species are globally rare or found only in the Great Lakes basin.

The wealth of natural resources has long made the region a heartland of both the U.S. and Canadian industrial economy. Economic activity in the Great Lakes basin exceeds $200 billion a year. There are notable concentrations of multi-sector manufacturing facilities in each of the Great Lakes States. The Region generates more than 50 percent of the total U.S. manufacturing output. About one-third of the Great Lakes basin's land is in agricultural use. The eight Great Lakes States account for 30% of nationwide agricultural sales, a $45 billion industry. The international shipping trade annually transports 50 million tons of cargo through the Great Lakes. Main commodities are grain, iron ore, coal, coke, and petroleum products. Almost 50% of this cargo travels to and from oversea ports, especially Europe, the Middle East, and Africa.

Recreation is also an important part of the economy. The annual value of the commercial and sport fishery is estimated at over $4.5 billion. The eight Great Lakes States have about 3.7 million registered recreational boats, or about one-third of the Nation's total. The 600-plus State parks in the Region accommodate more than 250 million visitors each year. It has been estimated that nearly 5.5 million

[2] While not located within the Great Lakes Basin Watershed, the Province of Quebec is a partner in Annex 2001 of the Great Lakes Charter and other Great Lakes initiatives.

[3] Canada refers to communities of indigenous people as “First Nations”.

This long term vision can be expressed simply, as follows:

The VISION: ***The Great Lakes Basin is a healthy natural environment for wildlife and people.***
All Great Lakes beaches are open for swimming.
All Great Lakes fish are safe to eat.
The Great Lakes are protected as a safe source of drinking water.

Our Collective Goals and Priorities

In keeping with our mission and long-term vision for the Great Lakes, the member agencies of the USPC will work together to protect and restore the chemical, physical, and biological integrity of the Great Lakes Basin Ecosystem. Accordingly, we have expressed our strategic priorities under four major goals:

1. Chemical Integrity - Reduce toxic substances in the Great Lakes Basin Ecosystem, with an emphasis on persistent bioaccumulative toxic (PBTs) substances, so that all organisms are protected. Over time, these substances will be virtually eliminated. Maintain an appropriate nutrient balance in the Great Lakes to ensure aquatic ecosystem health.

2. Physical Integrity - Protect and restore the physical integrity of the Great Lakes, supporting habitats of healthy and diverse communities of plants, fish and other aquatic life, and wildlife in the Great Lakes Basin Ecosystem. Protect Great Lakes water as a regional natural resource from non-sustainable diversions and exports. Promote improved land use practices and the enhancement of the Great Lakes Basin as a source of recreation and economic prosperity.

3. Biological Integrity - Protect human and biological health. Restore and maintain stable, diverse and self-sustaining populations of predominantly native fish and other aquatic life, wildlife, and plants in the Great Lakes Basin Ecosystem. Control and eliminate pathogens and prevent the introduction and spread of invasive species, to protect human health, ecological health, and economic vitality.

4. Working Together - Work together as an environmental community to establish effective programs, coordinate authorities and resources, report on progress, and hold forums for information exchange and collective decision-making, so the Great Lakes are protected and the objectives of the GLWQA are achieved. This last goal acknowledges the management and institutional challenges to effectively coordinate programs and authorities to achieve the restoration and protection of the Great Lakes.

Under each of the four goals, this Strategy identifies major environmental challenges facing the Great Lakes Basin Ecosystem. Each section, which represents a specific environmental challenge, provides a description of the issue, lists the major current or future governmental program(s) to address the issue, sets forth an ambitious objective(s), which typically includes a date and a measurable environmental outcome, and lists specific key actions to achieve or support the objective(s). Some of the key actions in a

CHEMICAL INTEGRITY: REDUCING AND ELIMINATING THE THREAT OF TOXIC POLLUTION AND E

exemplary and has positioned the Great Lakes to be a world class leader with regard to advancing water quality regulatory protection.

Key Objectives:

- By 2006, 100% of all NPDES permitted discharges to the Lakes or major tributaries will have permit limits that reflect the Guidance's water quality standards, where applicable.

Key Actions:

- USEPA will work with the States and eligible Tribes as they are beginning to incorporate the Guidance into their regulatory programs in order to help States and eligible Tribes identify and correct problems. USEPA will provide technical assistance, permit writing training, and other training courses.

Establishing Total Maximum Daily Loads

Under Section 303(d) of the Clean Water Act, States have listed, with Federal approval, portions of the Great Lakes and their tributaries as "impaired waters." These waters do not meet the approved State water quality standards even after permits or other pollution control requirements have been issued. The Clean Water Act requires that States and authorized Tribes address these impaired waters by developing a Total Maximum Daily Load (TMDL) determination which specifies the maximum amount of a specific pollutant that a waterbody can receive from multiple pathways, including stormwater runoff and air deposition, and still meet water quality standards (including the GLI, where applicable).

Recent State actions have established priority rankings for impaired waters, including the Great Lakes, and have scheduled TMDL development for these waters. The TMDL effort for each of the Great Lakes will be described in the TMDL Great Lakes Strategy, which will be discussed in the next LaMP update and closely linked to lakewide management planning. The development and use of innovative approaches will also be considered in order to expedite the improvement of water quality and removal of impairments.

Key Objectives:

- By 2013, complete TMDLs for each Great Lake and Great Lake tributary listed on each state's 1998 303(d) list. Complete TMDLs for all waterbodies subsequently added to future 303(d) lists no later than 15 years after their first appearance on the list.

Key Actions:

- By 2002, include an update on the status of the Great Lakes TMDL Strategy in each of the LaMP updates.

- By 2004, USEPA, with assistance from States, will complete the Great Lakes TMDL Strategy, which will include EPA, States, and Tribal roles and responsibilities for completing TMDLs for the Great Lakes and their tributaries.

- Continue to explore innovative or alternative approaches for developing TMDLs to address impaired waters and for implementing programs to restore these waters.

- USEPA will assist the States and Tribes in their development of TMDLs for waterbodies tributary to the Great Lakes by providing training, resources, guidance, and technical support as needed.

- The U.S. Geological Survey (USGS) will provide technical assistance to States, Tribes, and local agencies in developing TMDLs, including data and information on Great Lakes tributaries, by undertaking in-depth studies with State and local agencies through the Cooperative Water-Resources Investigations Program.

Achieving the Challenges of the Great Lakes Binational Toxics Strategy

On April 7, 1997 the governments of Canada and the U.S. adopted the Great Lakes Binational Toxics Strategy (GLBTS) for the virtual elimination of persistent toxic substances in the Great Lakes, setting a precedent for cooperation between the two countries in the area of toxic reductions. For the first time, the U.S. and Canada acted together to establish specific, quantitative reduction targets for chemical substances. The GLBTS uses pollution prevention as the principal tool in achieving results.

Key Actions:

- By 2006, create ten additional voluntary partnerships with sources that use or release persistent toxic substances.

- Continue to initiate pesticide Clean Sweep programs in the Basin to promote the safe disposal and elimination of toxic substances.

- By 2003, investigate the contribution of backyard refuse burning to total releases of dioxins and furans and if appropriate, initiate state and local programs to provide affordable local alternatives to backyard refuse burning.

- By 2007, evaluate the implementation of the GLBTS and develop a process to renew commitments and challenges.

Addressing Impacts from Air Deposition

Great Lakes researchers have collected a convincing amount of data demonstrating that toxic pollutants emitted into the atmosphere are being deposited directly into the Great Lakes, or deposited into inland ecosystems with subsequent transport to the Great Lakes by tributary flows and other processes. Furthermore, toxic air pollutants may be transported short or long distances from their original sources, and some chemicals are transported atmospherically on a global scale. The Lake Michigan Mass Balance Study (LMMB), which focuses on four chemicals that are representative of classes of pollutants in the Great Lakes (PCBs, trans-nonachlor, atrazine, and mercury), estimates that 1600 pounds of mercury and 3400 pounds of PCBs are deposited into Lake Michigan every year. Fish consumption advisories remain in effect in the Great Lakes for mercury, PCBs, and other pollutants, and atmospheric deposition is known to be a major contributor of these substances.

Under the Clean Air Act (CAA), USEPA has been working to reduce emissions of toxic pollutants through regulatory and non-regulatory methods. Under the Maximum Available Control Technology (MACT) program, USEPA is using a performance-based approach to controlling toxic air pollutants. Since 1993, MACT standards have been developed by USEPA for over 80 source categories, with additional source categories still under development[4].

State agencies and USEPA have also developed voluntary partnerships and agreements with facilities to reduce their toxics use, including steel mills, hospitals, schools, automobile manufacturers, dairy farms and dental offices.

In response to the mounting evidence of air deposition pollution to water bodies, Congress included the GreWo
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[4] Regulations for large municipal waste combustors that have recently been fully implemented and regulations for medical waste and small municipal waste incinerators that will be implemented in 2002 and 2005, respectively, will greatly reduce mercury and dioxin emissions from these sources.

water quality violations, and determining if the current Clean Air Act provisions are sufficient to prevent serious adverse effects to public health and the environment.

Since 1990, the Integrated Atmospheric Deposition Network (IADN) has monitored deposition rates of priority air toxic pollutants to the Great Lakes. In addition, the eight Great Lakes States, the Province of Ontario, and the Great Lakes Commission have developed the Great Lakes Regional Air Toxics Emissions Inventory and Regional Air Pollutant Inventory Development System (RAPIDS) to create the best available toxics emission estimates from all sources (point, area, and mobile) for regional modeling efforts.

Working together, USEPA, NOAA, States, and Tribes will continue to support efforts to monitor, characterize, model, and quantify emissions sources of toxics in the Great Lakes Region. We will work to reduce international emissions and support models that define the relationship between air pollutant sources and the effects of pollutants deposited on the Great Lakes. This information will guide regulatory and non-regulatory programs that work to eliminate the impacts of air toxic deposition and the risks of air toxics to both humans and the Great Lakes Ecosystem.

Key Objectives:

- Through the implementation of MACT standards promulgated in September 1997, achieve at least a 90% reduction in mercury and dioxin emissions from 1996 baselines from medical waste incinerators.

Key Actions:

- Implement the Clean Air Act provisions, including MACT standards, and commit to strong enforcement of these standards by USEPA and State Agencies.

- USEPA is committed to reducing emissions of mercury from coal-fired utilities through a nationwide cap and trade program. This program has been announced by the President and is currently under consideration by Congress.

- Adopt and implement emissions standards covering source categories accounting for 90% of the emissions of 30 identified urban air toxic pollutants.

- Establish national measures which enable State, Tribal, and local agencies to develop strong and flexible programs to reduce air toxics.

- Conduct periodic asessments of air quality, exposure and estimated risks from toxics for urban areas in the Great Lakes Region and provide information to the public.

- The State of Wisconsin will propose regulations to reduce atmospheric mercury emissions from major electric utilities by 90% within 15 years after promulgation.

- Consistent with its statutory goal, Minnesota will reduce statewide mercury releases to air by at least 70% by 2005, compared to 1990 levels.

- Support the expansion of state and tribal monitoring efforts related to air toxic deposition, particularly for PBTs which support legislation and policy efforts. Support the efforts of Tribes in the Great Lakes Basin in the development of Tribal Implementation Plans (TIPs) to address adverse environmental impacts resulting from air deposition.

- Integrate IADN with new regional, national, and international monitoring efforts and report on the deposition of PBTs. Add mercury deposition monitoring to at least one U.S. IADN station and evaluate the feasibility and cost of adding additional chemicals of concern to the network, as appropriate. Evaluate the expansion of the IADN network to include new urban sites in order to determine urban sources and evaluate current and future regulations.

- Expand and improve the Great Lakes Regional Air Toxics Emissions Inventory and RAPIDS to support analyses of emission trends. Make special efforts to focus on PBTs of concern to the Great Lakes including an in-depth quality assurance effort.

- Study the relationship between the Great Lakes Regional Air Toxics Emissions Inventory and atmospheric deposition monitoring data. Work to better understand source/receptor relationships and improve inventory and modeling techniques to better characterize emissions and forecast deposition, and support future efforts to resolve these issues.

- Promote the Urban Air Toxics Strategy on the Federal, State, and Tribal level. Commit to further defining air toxics risks to the Great Lakes Basin's residents and ecosystems by conducting multi-pathway risk studies and community assessments. Assure that the residual risk (112(f)) program addresses atmospheric deposition concerns of PBTs, including evaluation of emissions, impacts, and multiple exposure pathways.

Achieving Out-of-Basin Toxics Reductions

A major challenge for the Great Lakes is to address persistent toxic pollutants on a national, international, and global scale. These pollutants easily transfer among air, land and water and travel across vast geographic boundaries. Recognizing the need to achieve out-of-basin toxics reductions, the GLBTS is closely coordinated with other domestic and international programs. The national multi-media PBT Program is focused on reductions for the same set of pollutants, and the efforts of the GLBTS chemical-specific workgroups have supported the development of the PBT Program national action plans. The GLBTS also is coordinated with USEPA's Office of International Affairs to support international efforts, such as the Persistent Organic Pollutants and Heavy Metals Protocols under the United Nations' Economic Commission for Europe's Convention (UNECE) on Long Range Transboundary Air Pollution (LRTAP), the Stockholm Convention on Persistent Organic Pollutants, and the North American Commission for Environmental Cooperation (CEC) Sound Management of Chemicals Program. Under the latter program, North American Regional Action Plans (NARAPs) have been developed for a number of chemicals. These efforts work toward international voluntary activities and legally-binding agreements resulting in reductions of persistent toxic substances.

Key Actions:

- Continue to support and coordinate with national initiatives that will reduce or eliminate out-of-basin inputs of toxics to the Great Lakes, including the PBT Program.

Promoting the Safe Consumption of Great Lakes Fish and Wildlife

Many North Americans enjoy fishing and hunting in the Great Lakes Basin, and many residents earn their livelihood from these activities. Unfortunately, a variety of persistent toxic substances circulate within the Great Lakes environment and bioaccumulate in animal tissues. Several studies of Great Lakes fish consumers have shown that long-term exposures can cause chronic health effects and pose a special risk to fetuses, children, women of child-bearing age, and those who extensively fish for food. Contaminant levels and resulting exposures due to wildlife consumption have received less intensive study.

The use of consumption advisories is an interim measure to reduce exposure by promoting the safe consumption of fish and wildlife. All the Great Lakes and their connecting channels are currently under a fish advisory, mainly due to PCBs, although dioxin and chlordane also cause advisories. In addition, several States have state-wide mercury advisories for their inland waters. Unfortunately, surveys have revealed that a large portion of the subsistence and sport fish consuming public is unaware of these advisories.

Based on our current understanding of how these chemicals circulate in the environment, it is expected that advisories will be in place for several decades. However, cleaning up contaminated sediments and reducing new loadings of toxic substances would significantly shorten this time frame. There is also a concern that invasive species can potentially redistribute pollutants in the food web. The long-term goal is to ensure that all Great Lakes fish and wildlife are safe to eat without restriction.

Key Objectives:

- Implement actions identified throughout this Strategy, particularly in the Contaminated Sediments and Air Deposition sections, to reduce exposure to toxic substances from the consumption of contaminated fish and wildlife. As an indicator of progress toward the reduction of toxic substances in native, top-level predators, concentrations of PCBs in whole lake trout and walleye samples will decline by 25% in the period from 2000 to 2007.

Key Actions:

- ATSDR, State health and environmental agencies, Tribes, and USEPA will continue to improve their understanding of exposure and health risks associated with the consumption of contaminated fish and wildlife. Enhanced communications will be provided to the public, including at-risk populations, about the importance of following existing fish and wildlife advisories.

- USEPA will report every two years on concentrations of key pollutants (PCBs, chlordane, and mercury) in coho and chinook fillets, as well as whole lake trout and walleye. Consideration will be given to monitoring and reporting of other chemicals of potential health concern, such as chlorinated napthalenes, polybrominated diphenyl ethers, and toxaphene, as part of a long term trend monitoring program.

- Evaluate the result of surveys sponsored by ATSDR, States, USEPA, Tribes, and academic institutions on the effectiveness of fish advisories and develop improved systems for

communicating information to high-risk communities, including non-English speaking minorities and sensitive populations.

- ATSDR, USEPA, State and Tribal health agencies will pursue further research in the area of mercury exposure from fish and wildlife consumption.

- Federal, State, and Tribes will support the work of the LaMPs and any Great Lakes human health committees by providing information on contaminants and fish and wildlife consumption advisories.

- Federal, State, and Tribes will provide data from their fish tissue sampling programs to the Great Lakes Fishery Commission for inclusion in the Commission's State of the Lake reports, which are issued on a rotating basis for each Lake every five years.

- States, USEPA, and Tribes will explore contaminant levels and exposures from the consumption of wildlife and native foods.

Maintaining A Healthy Nutrient Balance

Phosphorus is an essential element for all organisms and is often the limiting factor for aquatic plant growth in the Great Lakes. Although phosphorus is found naturally in tributaries and run-off waters, the historical problems caused by elevated levels have predominately originated from human-made sources. Sewage treatment plant effluent, agricultural run-off, and industrial processes have released large amounts of phosphorus into the Lakes.

Strong efforts that began in the 1970s to reduce phosphorus loadings have been successful in also reducing nutrient concentrations in the Lakes, although high concentrations still occur locally in some bays and harbors. Phosphorus loads have decreased in part due to changes in agricultural practices (e.g., conservation tillage and integrated crop management), use of non-phosphorus detergents, and improvements made to sewage treatment plants and sewer systems.

Our overall approach is to ensure that Great Lakes waters shall be free from nutrients, directly or indirectly entering the waters as a result of human activity, in amounts that create growths of aquatic life that interfere with beneficial uses.

Key Actions:

- Continue to monitor phosphorus concentrations closely to ensure nutrient levels can support desired fish community structures and populations.

- Continue to support the implementation of rural and urban nutrient management practices under Section 319 of the CWA and Section 6217 of the Coastal Zone Management Act (CZMA) .

- Construct and test models of nutrient cycling in each of the Great Lakes to account for the role now played by zebra mussels.

- Assess the capacity and operation of existing sewage treatment plants in the context of increasing human populations being served to determine if additional upgrades in construction or operations may be required.

- In cooperation with participating State, Tribal, and federal agencies, USGS will continue to collect streamflow data, and, in selected areas, water-quality and ancillary data to support the calculation of annual tributary loadings to the Lakes.

PHYSICAL INTEGRITY: PROMOTING HABITAT PROTECTION, WATER QUANTITY MANAGEMENT, AND IMPROVED LAND USE PRACTICES

Goal: ***Protect and restore the physical integrity of the Great Lakes, supporting habitats of healthy and diverse communities of plants, fish, and other aquatic life, and wildlife in the Great Lakes Basin Ecosystem. Protect Great Lakes water as a regional natural resource from non-sustainable diversions and exports, and promote improved land use practices.***

The Great Lakes Basin is a unique Ecosystem, containing many ecologically rich areas and diverse
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National Strategy to Restore Coastal Habitat continues to direct restoration and protection activities. USEPA supports support habitat improvement practices, including construction and enhancement of coastal wetland systems, under Section 319 of the Clean Water Act. The USGS, USFWS, and Tribes are involved in mapping fish spawning grounds. Some States are preparing "biodiversity management plans" and mapping fish spawning grounds as well.

In addition, non-governmental organizations (NGOs) are identifying "priority conservation areas," "potential wilderness areas," "American Heritage Rivers," "biodiversity hotspots," "important bird areas," and preparing many other recommendations for protecting or restoring high priority natural areas. Most of these efforts are ongoing, and this short list is far from complete.

Recognizing the particular vulnerability of coastal habitat, this Strategy focuses on its protection and restoration as a first priority, with a special focus on coastal wetlands, a unique and limited resource. It also recognizes and addresses the long-term need to protect and restore habitat throughout the entire Great Lakes Basin.

Key Objectives:

- With the philosophy of no net loss, continue to fulfill Federal, State, and Tribal management responsibilities for the estimated 10 million acres of coastal and inland wetlands on the U.S. side of the Basin.

- By 2005, support the restoration of fish and wildlife habitats by developing partnerships with Federal, States, Tribes, and private interests to construct habitats by beneficially using dredged material at six sites.

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[6] This goal will be achieved primarily through non-regulatory programs (e.g., USDA's Wetland

Special Focus Area: Great Lakes Coastal Wetlands

The Great Lakes coastal zone includes the relatively warm and shallow waters near the shore, coastal wetlands, and the land areas directly affected by lake processes. These areas are the most diverse and productive parts of the Great Lakes ecosystem. Great Lakes coastal wetlands play a pivotal role in the aquatic ecosystem of the Great Lakes, storing and cycling nutrients and organic material from the land into the aquatic food web. Most of the Lakes' fish species depend upon them for some portion of their life cycles. Large populations of migratory birds rely on them for staging and feeding areas. Coastal areas also receive some of the most intense human activity. As a result, the areas that contain the greatest biological resources are subject to the greatest stress.

Two important tools in coastal wetland protection are NOAA's CZM Program and the SOLEC Indicators Initiative. Under the CZM Program, NOAA, and the States select enhancement areas for funding to protect, restore, or enhance the existing coastal wetlands base or to create new coastal wetlands. Participants in the SOLEC Indicators Initiative have identified coastal wetlands as a special focus area, and the Great Lakes Coastal Wetland Consortium will develop basin-wide monitoring methods for these important habitats.

Key Actions:

- Federal, State, and Tribal agencies will continue to participate in the Great Lakes Coastal Wetlands Consortium, initiated in early 2000.

- By 2003, the Great Lakes Coastal Wetland Consortium will create and populate a binational GIS database on Great Lakes coastal wetlands accessible to all scientists, decision makers, and the public. This database will contain data on the location and classification of coastal wetlands and data on indicators of wetland quality.

- By 2003, the Great Lakes Coastal Wetland Consortium will design and establish a program for monitoring the quality of international Great Lakes coastal wetlands. In addition, It will identify and rank major threats to coastal wetlands (e.g., development, invasive species, hydrological alteration, resource extraction, shoreline hardening, etc.).

Protection of Great Lakes Water Resources

Over the past few years, the diversion of water from the Great Lakes Basin has become a high profile issue, both nationally and internationally, most notably centered on a Canadian company's 1998 proposal to export Lake Superior water to markets overseas. Throughout the Basin, numerous concerns were voiced over the lack of any consultation or analysis of the environmental implications of such a withdrawal. The request was subsequently withdrawn. This situation brought the issue of water diversion to the top of the Great Lakes agenda.

In accordance with Section 504 of the 2000 amendments to the Water Resource Development Act (WRDA), the Great Lakes Governors have led the development of a stronger regional water management system. Under WRDA, no bulk export or diversions from the Basin can take place without the unanimous approval of all Great Lakes Governors. Recently, the Great Lakes Governors and Premiers have committed to developing conservation and restoration-based standards for reviewing proposed

withdrawals. The long-term goal is to manage Great Lakes water resources in a manner which will protect and sustain the Great Lakes Ecosystem, while also maintaining a strong economy.

Ground water is the source of drinking water for about 8.2 million people within the Great Lakes Watershed. Recent publications, including USGS's report *The Importance of Ground Water in the Great Lakes Region*, have increased public awareness of ground water resources. Besides providing drinking water, this important natural resource is a large, subsurface reservoir that slowly releases water to provide reliable stream water flow and helps ensure habitat for aquatic animals and plants during periods of low precipitation. This resource needs to be characterized according to its availability, quality, and demand to develop a sustainable supply for all uses.

***Key Actions*:**

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communities; fostering distinctive, attractive communities with a strong sense of place; maintaining local authority for planning and managing growth while recognizing the need for regional perspectives and cooperation; providing a variety of transportation choices; providing incentives for collaboration among local governments, and partnerships among local, Tribal, State, and Federal levels of government; and encouraging revenue policies that promote balanced growth decisions. There are a wide variety of stakeholders in the Smart Growth movement including environmentalists and community activists, community development organizations; real estate developers; planners; Federal, State, Tribal, and local government officials; lending institutions, and architects.

Great Lakes States have been leaders in pioneering innovative Smart Growth legislation. Examples include Wisconsin's Comprehensive Planning Grant programs, and Pennsylvania's $650 million "Growing Greener" investment, "Growing Smarter" land-use reforms, and nationally-known Land Recycling Program. In 1996, the USEPA and NOAA joined with several non-profit and government organizations to form the Smart Growth Network. The Smart Growth Network (SGN) works to encourage development that serves the economy, community, and the environment. The Network provides a forum for:

Raising public awareness of Smart Growth and the implications of development decisions for the economy, community, and the environment;
Promoting Smart Growth best practices through educational publications and other venues;
Developing and sharing information, innovative policies, tools, and ideas;
Fostering collaboration, among Network partners and members who represent various interests, to apply Smart Growth approaches to resolve problems of the built environment; and,
Cultivating strategies to address barriers to, and to advance opportunities for, Smart Growth.

Other relevant activities include the implementation of State Coastal Nonpoint Pollution Control Programs developed pursuant to section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). This program provides for the implementation of management measures for site development designed to protect sensitive areas, limit increases in impervious cover, and limit land disturbance activities. Also, the Nonpoint Education for Municipal Officials Program (NEMO) supports improved land use decision making by educating local officials on the principles of natural resource based planning.

Key Actions:

- Continue to participate in and support the Smart Growth Network.
- Continue to implement State Coastal Nonpoint Pollution Control Programs.

Brownfield Redevelopment

A key component of Smart Growth is brownfields redevelopment. A Brownfield is a site that has actual or perceived contamination, as well as an active potential for redevelopment or reuse. It is estimated that there could be as many as 100,000 such sites in the Great Lake States, many of which are in the Basin. Because lenders, investors, and developers fear that involvement with these sites may make them liable

for cleaning up contamination they did not create, they are more attracted to developing new sites in pristine areas, or "greenfields."

USEPA's Brownfields Economic Redevelopment Initiative is designed to empower States, Tribes, communities, and other stakeholders to work together in a timely manner to prevent, assess, safely clean

strips, vegetation established between fields and surface waters, also help reduce sediment, nutrients, and chemicals entering tributaries that flow into the Great Lakes. Innovative programs such as USDA's Conservation Reserve Program (CRP), National Conservation Buffer Initiative, and the Environment Quality Incentive Program (EQIP) provide a systems approach for addressing agricultural non-point source pollution to the Great Lakes. The federal Farmland Protection Program, administered by the NRCS, supports matching grants and non governmental organizations to purchase conservation easements on agricultural lands. NRCS also supports the Great Lakes Commission's Great Lakes Basin Program for soil erosion and sediment control.

Through the CZMA, State coastal management programs coordinate, promote, and implement state efforts to address nonpoint sources of pollution. In addition, USEPA has several standing programs to address soil erosion and sedimentation within the Basin. Local conservation districts also play a key role in enhancing efforts to establish conservation buffers and no-till planting methods. Together, these efforts help sustain the production of food and fiber products while maintaining environmental quality and a strong natural resource base.

Thirty-eight percent of the Nation's 450,000 animal feeding operations exist in the Midwest, and the many of these are in the Great Lakes Basin. In 1999, the USDA and the USEPA issued a Unified National Strategy for Animal Feeding Operations (UNSAFO) to minimize the water quality and public health impacts of livestock operations. Two important steps in the Strategy were the recently proposed regulations to address water pollution from concentrated animal feeding operations and the voluntary development of Comprehensive Nutrient Management Plans (CNMP). The USEPA and USDA, in coordination with the States, have sought public comment, and will revise and implement this regulation and planning effort.

Key Objectives:

- Consistent with the goals of the National Conservation Buffer Initiative, establish 300,000 acres of buffers in the Great Lakes Basin by 2007 (base year 1999), using existing non-regulatory Federal and State programs, and track this progress under USDA's CRP.

- In accordance with the Unified National Strategy for Animal Feeding Operations, assist and track the development of CNMP for Animal Feeding Operations in the Great Lakes Basin by 2009. The continued technical and financial support provided under the UNSAFO and EQIP will be necessary to complete this goal.

Key Actions:

- USDA will continue to implement CRP and will work with any State's effort to supplement the CRP funding with a Conservation Reserve Enhancement Program targeted to the Great Lakes Basin. The development of forested riparian areas in the northern Great Lakes Basin will also be promoted as a means to support cold water fisheries.

- Encourage and support the National Association of Conservation Districts' Great Lakes Buffer/No-Till Program, which will help protect and enhance water quality in the Great Lakes and the tributaries that flow into the Lakes.

- USEPA will work with States to issue NPDES permits to concentrated animal feeding operations, or implement functionally equivalent approaches as per the Unified National Strategy for Animal Feeding Operations, Strategic Issue #3, or future Federal guidance or rules.

- Continue to support the implementation of rural and urban nutrient conservation practices by the States under Section 319 of the CWA and Section 6217 of the CZMA.

- By 2013, implement the CZARA management measures for facility wastewater and runoff from confined animal facility management.

Overflows from Sanitary Sewers and Combined Sewer Systems

During heavy wet weather events, sewer systems can be overwhelmed by high flows, resulting in the release of raw sewage from combined sewer overflows (CSO) and sanitary sewer overflows (SSO). Combined sewers, systems designed to collect both storm water and sanitary wastewater, can overflow when the capacity of the wastewater treatment facility is exceeded or when flows exceed the capacity of sections of the transport system. Separate sanitary sewer systems can also experience untreated discharges related to wet weather events. These can be caused by excessive inflow and infiltration, inadequate maintenance, and insufficient wet weather transport capacity. SSOs and untreated CSOs can contain pathogens that lead to beach closures and human health concerns, as well as oxygen demanding substances that can lead to low dissolved oxygen levels. Untreated CSOs discharges may also contain industrial pollutants.

USEPA's CSO Control Policy outlines approaches for addressing CSOs in order to achieve the requirements of the Clean Water Act. States have also adopted policies, strategies and rules consistent with the National CSO Policy, and use these as a basis for issuing permits and compliance orders for CSO control. CSO communities are required to develop and implement interim controls and long term control plans for assuring that CSOs do not cause or contribute to violations of water quality standards.

Avoidable SSO discharges can lead to enforcement actions by States or USEPA. USEPA is developing an SSO policy to help prevent avoidable SSOs and mitigate the impacts of those which are unavoidable.

Key Objectives:

- By 2005 100% of all CSO permits in the Great Lakes basin will be consistent with the national CSO Policy. All issued/reissued permits for CSO discharges will contain conditions that conform to the National CSO policy, and States will prioritize the reissuance of CSO permits under their permit backlog strategies.

- By 2010, all sewer systems will be operated under long-term comprehensive management plans which will optimize performance and minimize discharges from SSOs.

Key Actions:

- Prioritize wet weather program activities to focus on CSO and SSO discharges impacting bathing beaches and other areas of potential health risk exposure in the Great Lakes Basin.

Key Action:

- Continue human health studies under the Great Lakes Human Health Effects Research Program, and make results available to environmental managers and the public.

Maintaining the Great Lakes as a Safe Source of Drinking Water

The Great Lakes have been, and continue to be, an abundant and high quality source of drinking water for millions of people. We must assure that the Great Lakes continue to provide a safe source of drinking water for residents of the Basin. We will work together to carry out several initiatives that will assist us in meeting this goal.

The SOLEC and the American Water Works Association will undertake a joint binational effort to assess the quality of water at 22 drinking water treatment plants around the Lakes. These plants will monitor raw water for parameters such as Total Organic Carbon (TOC), turbidity, and microbial indicators. Measurement of these parameters over time at the U.S. locations will provide a useful snapshot of the untreated water as it enters the drinking water treatment system.

Under the Safe Drinking Water Act (SDWA), additional measures will be taken to address the possible formation of disinfection byproducts. The Stage 1 Disinfectants and Disinfection Byproducts Rule will require most large surface water plants, including those on the Great Lakes, to begin monitoring Total Organic Carbon (TOC) of raw waters by January of 2002. TOC levels are an important indicator of water quality and the potential formation of disinfection byproducts. The Rule requires additional treatments to address disinfection byproducts if TOC standards are exceeded in the raw water intake. This preventative measure will help insure that the subsequently treated water is of a high quality.

The SDWA also requires Source Water Assessments (SWAs) to be completed by 2003 for all public water systems. SWAs are largely qualitative assessments of potential vulnerabilities in the system, identifying intake points, potential contaminant sources, drainage area, etc. SWAs are conducted by the States and Tribes, and implementation measures to reduce vulnerabilities will be carried out by the States, Tribes, and local governments.

Key Action:

- Beginning in 2002, USEPA, in cooperation with local utilities, will track water quality at the intake points of selected drinking water treatment plants around the Lakes. Findings will be reported to the public through the biennial SOLEC State of the Lakes report.

Promoting Clean and Healthy Beaches

Most Great Lakes beaches provide a safe and enjoyable location for outdoor recreation and swimming. Past monitoring studies have shown that beach pollution is usually infrequent or confined to areas near

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from combined sewer overflows, sanitary sewer overflows, and malfunctioning sewage treatment plants and septic tanks. Untreated storm water runoff from cities and rural areas, which may contain wildlife feces and pet waste, can be an additional source of beach water pollution.

USEPA, in concert with States, eligible Tribes, and local agencies, will implement the newly-passed Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000. The Act requires each State having coastal waters (which includes the Great Lakes) to review current water quality criteria and standards for coastal recreation waters of the State for certain pathogens, and adopt protective water quality standards. The Act authorizes studies and assessments regarding human health impacts of pathogens and the development of indicators for improving detection of pathogens in coastal waters. The Act also provides funding to States and eligible Tribes to develop and implement beach monitoring and notification programs, based on criteria outlined in USEPA 's National Beach Guidance and Grant Performance Criteria for Recreational Waters.

Key Objectives:

- By 2010, 90% of monitored, high priority Great Lakes beaches will meet bacteria standards more than 95% of the swimming season.

Key Actions:

- By 2005, States and local agencies will put into place water quality monitoring and public notification programs that comply with the USEPA National Beaches Guidance at 95% of all high priority Great Lakes beaches.

- By 2004 or according to approved TMDL schedules, States and local agencies will evaluate Great Lakes beaches which are closed more than 5% of the swimming season to determine pollutant sources.

- By April 2004, all Great Lakes States will adopt bacteria criteria at least as protective as USEPA's Ambient Water Quality Criteria for Bacteria - 1986.

- By 2003, there will be pilot projects in the Great Lakes to support research being conducted on better indicators of the potential presence of pathogens, and rapid sampling technologies and techniques for microbial and viral contamination to identify risk before exposure takes place.

- Federal, State, Tribal and local government agencies will work to reduce or eliminate closings, understand reasons for closings, and identify pollution sources at all monitored beaches closed more than 5% of the swimming season. USEPA will work with States to target CSOs, SSOs, and CAFOs that may be contributing to these beach closings in order to reduce or eliminate them as a source of pollution, and will target existing technical, administrative, and financial support to States and local agencies to assist in the identification and remediation of pollutant sources.

- USEPA will provide tools and available funding to State, local, and Tribal governments to improve infrastructure for monitoring Great Lakes beach water quality, communicating to the public, and implementing actions to reduce closings. Such actions include:

- Encouraging the States to ensure that a reasonable proportion of resources for infrastructure improvements be devoted to projects having a positive beneficial effect on the water quality of Great Lakes beaches.

The Great Lakes Fishery Commission (GLFC) is a binational organization whose commissioners are appointed by the U.S. and Canadian Federal governments. It is responsible for the management of sea lampreys in the Great Lakes Basin, supporting fisheries research, and advising the U.S. and Canadian governments on means to improve the productivity of Great Lakes fisheries. The GLFC's Lake Committees, consisting of representatives of State, Provincial and Tribal Fishery agencies, have developed fish community objectives for each lake.

Key Actions:

- Support GLFC Lake Committees' fishery management efforts so that each lake supports a healthy and productive fishery, including naturally reproducing populations of native fish.[7]

Preventing Unplanned Introductions and Controlling Invasive Species

Invasive species adversely affect both the economy and ecology of the entire Great Lakes Basin, including aquatic, wetland, and terrestrial ecosystems. Over 160 invasive species have entered the Great Lakes-St. Lawrence system over the last 150 years. Almost one-third of such species have been introduced since the

[7] The GLFC Lake Committees' efforts are consistent with the Annex 1 of the GLWQA, which States that lake trout should be maintained as the top predator in Lake Superior.

[8] Since 1848, the Chicago River diverts some of the waters of Lake Michigan into the Mississippi River watershed as a means of alleviating water quality concerns in Lake Michigan and to provide a navigation link between the Great Lakes and Mississippi River.

by invasive species already established in the Great Lakes Basin. The partners to this Strategy will work together through existing institutional arrangements, such as the Great Lakes Panel on Aquatic Nuisance Species, and create new initiatives as necessary to advance the prevention, containment, and control of invasive species. The ultimate goal is to eliminate further introductions of invasive species to the Great Lakes Basin.

Key Objectives:

- By 2010, substantially reduce the further introduction of invasive species, both aquatic and terrestrial, to the Great Lakes Basin Ecosystem.

Key Actions:

- Ensure that all vessels entering the Great Lakes comply with ballast water management standards developed by the U.S. Coast Guard (USCG). Currently, these standards require open-ocean ballast water exchange where feasible. The USCG is currently developing new, environmentally protective standards to guide the development and implementation of the next generation of ballast water management technologies.

- Implement ongoing and new research activities and adaptive strategies to contain and control aquatic and terrestrial species that have already invaded the Great Lakes Basin, in order to reduce their negative impacts on native biota and their habitats.

- By 2005, through the cooperative effort between NOAA and other agencies, determine the efficiency of open-water ballast water exchange as the primary method to prevent introductions via ballast water.

- By 2005, through the cooperative effort between NOAA, USEPA, USCG, and the Great Lakes shipping industry, determine the potential threat of “no ballast on board” (NOBOB) vessels and prioritize actions to address this issue.

- By 2005, further investigate the relative risk from other sources and pathways of introducing new invasive species, including bait fish, recreational boating, cargo, ornamental plants, and aquaculture.

- Develop cooperative programs between Federal agencies and representatives of foreign governments to identify potential source regions and pathways and to anticipate and prevent invasive species introductions into the Great Lakes Basin.

- Provide information and Great Lakes' perspective to Congress for consideration during the re-authorization of the National Invasive Species Act (NISA), which is expected to occur in 2002, as well as to the International Maritime Organization policy forum, which is currently developing a global policy for ballast water management.

- By 2003, develop a framework to integrate and coordinate multi-agency responses, including Federal, State, Tribal, and local agencies, to address and potentially control new invasive species as soon as they are discovered.

- Continue to examine and implement chemical, physical, and biological control methods to address already established species, including the use of barriers, such as the dispersal barrier at the Chicago Sanitary and Ship Canal, to restrict the spread of aquatic invasive species.

- Continue to support a variety of programs to help recreation boaters ensure that their boats do not transport invasive species via motor props, hull fouling, or in bait tank water.

- Continue and expand research to determine the spread and impacts (biological and economic) of invasive species in the Great Lakes Ecosystem.

- By 2006, coordinate and enhance the monitoring of high-risk areas for the early detection of invasive species.

WORKING TOGETHER: EFFECTIVELY COORDINATING PROGRAMS AND RESOURCES TO PROTECT AND RESTORE THE GREAT LAKES

Goal: ***To work together as an environmental community to establish effective programs, coordinate authorities, and hold forums for information exchange and collective decision-making, so that the Great Lakes are protected and the objectives of the Agreement are achieved.***

Implementing the Great Lakes Water Quality Agreement

Binational responsibility for the protection of the Great Lakes is a necessity as four of the five Great Lakes are shared by the U.S. and Canada. Beginning in 1909 with the signing of the Boundary Waters Treaty between the U.S. and Canada, there have been over 90 years of international and interstate cooperation on Great Lakes issues. The GLWQA was signed in 1972, and was amended in 1978, 1983, and 1987. It was reviewed by the U.S. and Canada in 1999-2000 and will be reviewed periodically in the future.

The GLWQA establishes environmental goals and commitments for the Great Lakes to monitor and control pollution and water quality throughout the Basin. These goals help to establish joint priorities and lay the groundwork for joint strategies to clean up and protect the Great Lakes. The GLWQA has served as a prime example of international cooperation to address issues of mutual concern. The evolution of this institutional framework serves as a model for other areas of the country and for other countries to follow in the 21st century.

As outlined in Annex 2 of the GLWQA, the Great Lakes Program is characterized by three progressive scales of problem definition: “Basin-wide”, "Lake-wide" and localized "AOCs". Environmental problems are addressed at different scales depending on their scope, in order to design effective prevention and control strategies. Consequently, the Great Lakes Program involves a "nested" set of activities, managed and implemented by an alliance of Federal, State, Tribal, and non-government agencies. LaMPs and RAPs are the major organizing tools of the program.

The International Joint Commission's Oversight Role

The International Joint Commission (IJC) was established under The Boundary Waters Treaty of 1909. The IJC is an independent international organization charged with preventing and resolving disputes over the use of waters shared by the U.S. and Canada. Under the GLWQA, the IJC assesses progress and

[9] Collingwood Harbor, Ontario has been delisted.

regarding necessary and sufficient information to characterize the State of the Lakes Ecosystem is a way to facilitate more efficient monitoring and reporting programs. The relative strengths of the agencies will be utilize to improve the quality and timeliness of data collection, avoid duplication of effort, and make the information available to multiple users, including the general public.

The dialogue developed as part of the biennial SOLEC has been an appropriate launching point for addressing and agreeing on indicator development, information gathering, and reporting. The SOLEC process, which is binational, has identified over 80 indicators to date that will provide information on all components of the Great Lakes Ecosystem. These indicators will provide information to the public, the LaMP committees, and a wide spectrum of other Federal, State and Tribal agencies to gauge the health of the lakes. Trends and status will be coordinated with the Government Performance and Reports Act requirement to insure fully coordinated reporting processes and procedures. In addition, a Lake Michigan Monitoring Council has been formed to assist in ensuring that monitoring resources and information are shared, coordinated, and support agreed upon indicators. This effort will serve as a model for other Lakes.

***Key Objectives*:**

- By 2006, the SOLEC, LaMP, and RAP processes will provide clear information on Great Lakes water quality measures, trends, and actions (e.g., water quality trends, fish tissue trends, beach closures, RAP and LaMP implementation, ecosystems restored); will be accessible to the public via the Internet; and will be updated on a regular basis.

***Key Actions*:**

- Continue supporting SOLEC indicator process, through a network of Federal, State, Tribal and non-governmental groups. Include reports on indicators and ensure the process is fully coordinated at the Lake-wide and local levels.

- Support the establishment and operation of Lake-specific monitoring committees designed to coordinate monitoring, data gathering, and data quality activities by multiple agencies and organizations.

Establishing Research Priorities for the Great Lakes

The challenges facing the Great Lakes community are complex and interrelated. Addressing all of the multiple challenges discussed in this Strategy requires a strong, well-focused research program. Scientifically sound management decisions based on fundamental ecosystem understanding and reliable facts about human health and the environment are the key to success. New research technologies must be developed to identify and assess environmental stressors. New remedial technologies must be developed to help restore and sustain the natural resources of the Ecosystem. The Great Lakes community is fortunate to have numerous Federal, Tribal, State, Provincial, and university research organizations that are poised to fulfill these scientific needs.

The International Joint Commission's Council of Great Lakes Research Managers (CGLRM) has a responsibility to identify binational research priorities and emerging issues relative to the Great Lakes Water Quality Agreement. In addition, the Council produces an annual Great Lakes Research Inventory.

The information produced by the Council can be used to identify the scientific knowledge gaps that limit the ability of Great Lakes managers to meet specific goals of the GLWQA. The research priorities and Research Inventory can assist Federal, Tribal, State, Provincial, academic institutions, and funding organizations in developing research objectives for the Great Lakes.

Most agencies conduct or fund research that address their mission-specific priorities. Through communication and collaboration, information is developed that provides the science-based decision-making framework for the management goals and key objectives throughout this strategic plan. Examples of several agency research programs follow:

A broad research foundation is necessary for understanding the ecosystems that support the Great Lakes. NOAA has a very broad and multidisciplinary scientific mission in the Great Lakes. NOAA, through the Great Lakes Environmental Research Laboratory and through the Sea Grant Research and Extension Program conducts research and monitoring that provides the fundamental understanding necessary to model and predict the structure and function of aquatic environments and to identify and integrate information to improve the scientific basis for decision-making. GLERL houses a unique combination of scientific expertise in ecosystem modeling and food webs, biogeochemistry, invasive species, physical limnology, fish ecology, climate, contaminant cycling, and water resources. New tools, approaches, and models use the new knowledge and the growth of understanding obtained to advance assessment and prediction. Improved models are able to better predict ecosystem behavior, and hence offer better guidance to resource managers and decision makers. NOAA research partnerships with academia, with other federal agencies, and with the private sector are critical components in an overall strategy to provide our Nation's leaders with the knowledge and application-oriented findings and recommendations they need to make informed decisions.

The U.S. Geological Survey (USGS) is a science and information agency that plays an important role in providing sound information on the environmental and natural resources to management and regulatory agencies. In the Great Lakes region, the USGS Great Lakes Science Center in Ann Arbor, MI (and its eight field stations and fisheries research vessels on each lake) and the USGS water resources offices in each of the eight Great Lakes States are the most well known units of the USGS. The Great Lakes Science Center conducts annual fish stock assessments, fishery research, coastal and wetlands ecology, terrestrial ecology c

RAP forums, each comprised of a broad array of stakeholders, as well as the biennial listening sessions at the IJC's Water Quality Forum.

We also recognize the extensive technical expertise of environmental organizations, public groups, educational institutions, and industry. The partners to this Strategy will actively seek views and perspectives on major activities through existing forums, focused public comment periods, and listening sessions.

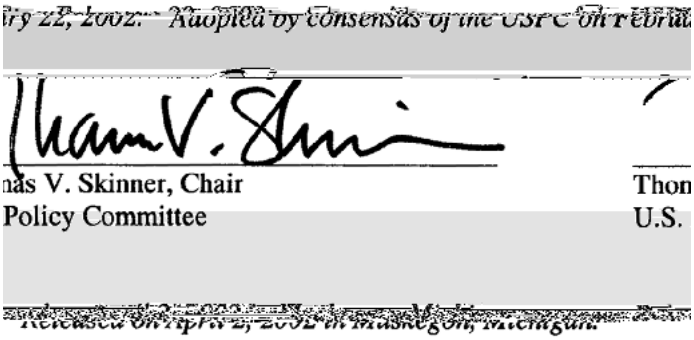
Key Actions:

- Continue to foster public involvement in Great Lakes programs by supporting AOC and LaMP Public Advisory Councils and Forums, and other specially designed mechanisms to obtain meaningful involvement.

Communicating and Reporting Progress

The USPC will work with our Canadian partners to provide periodic updates and progress reports to the public and other entities that have an interest or role in Great Lakes environmental protection. The primary vehicle for this will be periodic reports such as the overall *Report on the Great Lakes Ecosystem*, required by section 118 of the Clean Water Act, as well as State and other Agency reports. Other important vehicles for reporting are the binational SOLEC report, and periodic updates and reports from the LaMP and RAP processes. The SOLEC report emphasizes the health of the lakes from a scientific perspective. LaMPs and RAPs will report on progress toward achieving ecosystem restoration goals and restoring beneficial uses. A comprehensive progress report on the Great Lakes Ecosystem will be

This Strategy seeks to include our citizens and stakeholders in these actions as full participants who may take the lead in many areas. The States, Tribal, and Federal partners recognize the challenge of this effort but believe that such an approach is essential to achieving success. This Strategy demonstrates that we have entered a new era, with a commitment to renewing our partnership. We will continue to pursue cooperative actions to clean up and protect the Great Lakes. We recognize that the world's largest freshwater system and the vulnerable living resources that rely on it, merit the highest level of our efforts and attention.



Appendix 1

BENEFICIAL USE IMPAIRMENTS

ELIMINATION OF IMPAIRMENTS OF BENEFICIAL USES TO THE GREAT LAKES

Appendix 2

DESIRED OUTCOMES FOR THE GREAT LAKES ECOSYSTEM

Fishability - There shall be no restrictions on the human consumption of fish in the waters of the Great Lakes Basin Ecosystem as a result of anthropogenic (human) inputs of persistent toxics.

Swimmability - No public bathing beaches closed as a result of human activities, or conversely, all beaches are open and available for public swimming.

Drinkability - Treated drinking water is safe for human consumption; human activities do not result in application of consumption restrictions.

Healthy Human Populations - Human populations in the Great Lakes are healthy and free from acute illness associated with locally high levels of contaminants, or chronic illness associated with long-term exposure to low levels of contaminants.

Economic Viability - A regional economy that is viable, sustainable, and provides adequate sustenance and dignity for the human population of the Great Lakes.

Biological Community Integrity - Maintenance of the diversity of biological communities, species, and genetic variations within a species.

Virtual Elimination of Inputs of Persistent Toxic Substances - Virtual Elimination of inputs of persistent toxic substances to the Great Lakes system.

Absence of Excess Phosphorus - Absence of excess phosphorus entering the water as a result of human activity.

Physical Environmental Integrity - Land development and use compatible with maintaining aquatic habitat of a quantity and quality necessary and sufficient to sustain an endemic assemblage offish and wildlife populations.

Appendix 3

BINATIONAL TOXIC STRATEGY GOALS AND CHALLENGES FOR THE UNITED STATES

- Confirm by 1998, that there is no longer use, generation or release from sources that enter the Great Lakes Basin, of five bioaccumulative pesticides (chlordane, aldrin/dieldrin, DDT, mirex, and toxaphene), and of the industrial by-product octachlorostyrene. If ongoing, long range sources of these substances from outside of the United States and Canada are confirmed, work within existing international framework to reduce or phase out releases of the substances.

- Confirm by 1998, that there is no longer use of alkyl-lead in automotive gasoline; reduce or replace by 2005, alkyl lead in aviation fuel.

- Seek by 2006, a 90 percent reduction nationally of high level PCBs (>500ppm) used in electrical equipment.

- Seek by 2006, a 50 percent reduction nationally in the deliberate use and 50 percent reduction nationally in the release of mercury from sources resulting from human activity.

- Seek by 2006, a 75 percent reduction nationally in total releases of dioxins and furans from sources resulting from human activity. Seek by 2005, reductions nationally in releases of hexachlorobenzene, B(a)P, and dioxins, from sources resulting from human activity that enter the Great Lakes Basin.

- Promote prevention and reduced releases of Level 11 substances. Increase knowledge on sources and environmental levels of these chemicals.

- Assess atmospheric inputs of persistent toxic substances. The aim of this effort is to jointly evaluate and report on impact of long range transport of persistent toxic substances from world sources by 1998. If ongoing long-range sources are confirmed, work within existing international framework to reduce releases of such substances.

- Complete or be well advanced in remediation of priority sites with contaminated bottom sediments, in the Great Lakes Basin by 2006.

Binational Toxics Strategy of 1997

http://www.epa.gov/glnpo/p2/bns.html

Appendix 4

ROLE OF PARTNERS AND AGENCIES IN THE GREAT

provides information on shoreline classification, occurrence of biological resources, and human-use resources to assist in remedial and restoration planning at contaminated sediment sites and to support spill response activities. OR&R also conducts prevention and preparedness activities to prevent further degradation of Great Lakes sediments. The **Office of Ocean and Coastal Resource Management**, in partnership with state Coastal Zone Management programs, works with local communities and State agencies to preserve, protect, develop, restore, and enhance coastal zone resources. OCRM provides research, education, and protection of coastal and estuarine areas through the **National Estuarine Research Reserve and National Marine Sanctuary** programs and fosters economic redevelopment through Brownfields Showcase Grants. The **National Centers for Coastal Ocean Science** (NCCOS) conducts research, monitoring, and assessments of the coastal environment. NCCOS predicts impacts of pollution and coastal development on sensitive habitats and resources. NCCOS maintains contaminant-monitoring sites in Green Bay, and Lakes Michigan, Huron, St. Clair, Erie and Ontario to determine temporal contaminant trends. The **Office of Coast Survey** provides surveying, nautical charts, and other navigation services for safe shipping and boating. **National Sea Grant Program**, a partnership between universities and NOAA, encourages stewardship of Great Lakes coastal natural resources by providing funding to area universities for research of biotic, physical, and chemical systems, and for education, outreach and technology transfer. **National Environmental Satellite Data and Information Service**, **Cooperative Institute for Meteorological Satellite Studies (CIMSS)** develops and implements techniques and products to improve severe storm forecasting. The **National Weather Service** provides the weather and flood warnings, forecasts, and meteorological and hydrologic data used by research, environmental management, transportation, and community interests in the Great Lakes.

The **U.S. Army Corps of Engineers (USACE)** has responsibility for a civil works program under which it develops, maintains, and conserves the Nation's water and related land resources. It administers permit programs related to navigation and changes to the waters of the U.S.. The USACE plays a critical role in operating and maintaining the navigable waterways of the Great Lakes.

The **U.S. Coast Guard (USCG)** regulates pollution from ships, as well as the ship borne introduction of exotic species. Under the Oil Pollution Act of 1990, the Coast Guard has the lead responsibility for responding to oil spills in the Great Lakes. The USCG also works with USEPA to establish and implement area and regional Joint Contingency Plans for spills of oil and hazardous substances in the Great Lakes.

Three agencies of the **U.S. Department of Agriculture (USDA)** assist landowners with pollution prevention and control of non-point discharges from agricultural operations: the **Natural Resources Conservation Service (NRCS),** the **Cooperative State Research, Education, and Extension Service (CREES), and the Farm Services Agency (FSA)**. NRCS provides national leadership in the conservation and wise use of soil, water, plant, animal, and related resources; it works directly with agricultural producers on pollution prevention and control of non-point source discharges from agricultural operations. It also has an urban conservation program that provides technical assistance on non-point sources, such as: construction site runoff, fertilizer and pesticide inputs from lawns and other grassed areas, septic systems, flood control basins, and sediment storage ponds.

The **U.S. Environmental Protection Agency (USEPA)** is responsible for the Nation's regulatory programs for air, water, pesticides, and toxic chemicals. USEPA also sets national direction in environmental policy. **Great Lakes National Program Office (GLNPO)** will further the systematic and comprehensive approach to ecosystem management of the Great Lakes, as required by the Great Lakes Water Quality Agreement, by working with the Canadians and with other Federal and State agencies to

ensure that compatible and consistent approaches to environmental protection occur across the Basin. GLNPO will continue to provide leadership in updating and implementing this Strategy and will report overall progress, trends in environmental conditions, as well as specific accomplishments, in a timely manner to Congress and the public. GLNPO will assist the Regions and States in the implementation of the Great Lakes efforts and will seek to fulfill its specific mission as set forth in Section118 of the Clean Water Act. USEPA Headquarters, particularly the Office of Water and the Office of International Activities will continue to set overall national policy regarding USEPA's program and implementation of environmental statutes. USEPA Regions 2, 3, and 5 have important roles for carrying out Great Lakes programs, particularly through implementation and targeting of base program activities, and will continue this work to ensure mandates are fulfilled and goals are met.

The **U.S. Fish and Wildlife Service (USFWS)** serves as trustee to protect the interests of endangered species, migratory birds, and interjurisdictional fishery resources, such as the lake trout and lake sturgeon, and supports the States and other Federal agencies with population and habitat inventories. USFWS also manages 140,000 acres of Federal land holdings in the form of Fish and Wildlife Refuges in this Region

will permit the maximum sustained productivity of stocks of fish of common concern. It also formulates and implements a program to eradicate or minimize sea lamprey populations in the Great Lakes.

Role of Canadian Partners

Four of the five Lakes (all but Lake Michigan) are shared with Canada. Coordination with Canada involves Federal agencies, as well as provincial agency counterparts in Quebec and Ontario. The binational International Joint Commission is charged with advising the national governments on issues of concern regarding joint stewardship of the Lakes. The U.S. Department of State assists all U.S. Federal agencies as they address Great Lakes issues of concern to both countries. USEPA has lead agency responsibility for coordinating activities relative to the Great Lakes Water Quality Agreement with Canada (as amended by Protocol signed November 18, 1987). The Great Lakes National Program Office informs