



U.S. House of Representatives
Committee on Transportation and Infrastructure

James L. Oberstar
Chairman

Washington, DC 20515

John L. Mica
Ranking Republican Member

David Heynsfeld, Chief of Staff
Ward W. McCarragher, Chief Counsel

James W. Coon II, Republican Chief of Staff

January 22, 2008

SUMMARY OF SUBJECT MATTER

TO: Members of the Subcommittee on Water Resources and Environment
FROM: Subcommittee on Water Resources and Environment Staff
SUBJECT: Hearing on Progress toward Improving Water Quality in the Great Lakes

PURPOSE OF HEARING

On Wednesday, January 23, 2008, at 10:00 a.m., in Room 2167 Rayburn House Office Building, the Subcommittee on Water Resources and Environment will receive testimony from representatives from the United States Environmental Protection Agency, the Natural Resources Conservation Service, the Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the International Joint Commission, the Government Accountability Office, and members of the United States House of Representatives on Great Lakes water quality.

BACKGROUND

This memorandum summarizes efforts to improve water quality in the Great Lakes. It provides an overview of current water quality across the Great Lakes and state and federal programs to improve water quality.

Great Lakes Basin

The Great Lakes consist of Lakes Superior, Michigan, Huron, Erie, and Ontario. The lakes contain around 84 percent of North America's, and 21 percent of the world's surface fresh water supplies. Outflow rates from most of the Great Lakes are very slow: Lake Superior retains water for 191 years, Lake Michigan for 62 years, and Lake Huron for 31 years. Lake Ontario has a retention time of six years, and Lake Erie requires only 2.6 years for its waters to be exchanged. Those lakes with high retention times do not flush contaminants quickly, and are therefore particularly vulnerable to contamination.

The Great Lakes basin includes all of the state of Michigan, parts of Illinois, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and the Canadian province of Ontario. Approximately 40 million people live in the Great Lakes basin. Water in the lakes is used for a multitude of activities including drinking, fishing, swimming, boating, agriculture, industry, and shipping.

Water Quality in the Great Lakes

Industrialization and development have had a significant impact on the Great Lakes ecosystem. Over the past 200 years, the region has undergone significant industrialization. This industrialization has included mining, steel production, and machine tool and automobile manufacturing. Agriculture is also a significant component of the regional economy. The Great Lakes have historically provided convenient waterways for the movement of goods. They also provide process and cooling water for industrial users, and are used to generate hydroelectric power. While industrialization, agriculture, power generation, and other activities have produced significant economic development in the region, water quality has also been adversely impacted.

In its 2002 National Water Quality Inventory, the United States Environmental Protection Agency ("EPA") reports that 91 percent of assessed Great Lakes shoreline miles were impaired. (Only 520 of 5,521 total Great Lakes shoreline miles were assessed for the 2002 National Water Quality Inventory.) The leading causes of this impairment included pathogens, metals, and toxic organic compounds. EPA notes that the dominant cause of reported shoreline impairment is legacy, or historical, pollution – chiefly contaminated sediment.

In the same report, EPA reports that 99 percent of the assessed Great Lakes open waters were rated as impaired (84 percent (50,866 square miles) of the 60,546 square miles of Great Lakes open waters in the United States were assessed for the 2002 National Water Quality Inventory). The predominant causes of impairment were priority organics, metals (primarily mercury), and pesticides. The primary sources of these causes of impairment are atmospheric deposition, industrial sources, agriculture, and legacy, or historical, pollutants.

The EPA's 2005 National Coastal Condition Report II rated the overall condition of the Great Lakes as "fair-to-poor". Water clarity, drinking water quality, and dissolved oxygen were rated as "fair-to-good" or "good". Sediment contamination had a "poor" rating.

Pursuant to the Great Lakes Water Quality Agreement ("GLWQA"), since 1998 the EPA and Environment Canada have coordinated a biennial assessment of the ecological health of the Great Lakes ecosystem using a consistent set of environmental and human health indicators. The results of these assessments are published in the State of the Great Lakes reports.

In the State of the Great Lakes 2007 ("SOLEC") report, the status of the Great Lakes ecosystem is assessed as mixed. Based on the analysis of a series of categories (Contamination, Human Health, Biotic Communities, Invasive Species, Coastal Zones, Aquatic Habitats, Resource Utilization, Land Use-Land Cover, Climate Change), the SOLEC report characterizes the overall

condition of the Great Lakes as mixed: some conditions or areas are good, while others are poor.¹ Some of these conditions were reported as having improved, while others had worsened.²

The following sections provide summaries of the primary indicator categories for Great Lakes ecosystem health included in the SOLEC report.

Contamination: The SOLEC report characterizes contamination of the Great Lakes as mixed, but improving. Lake Superior is rated as good, Lake Ontario as poor, and the remaining lakes as mixed for contamination. The report notes that concentrations of some chemicals have declined significantly over the past 30 years, and that the overall trend of Great Lakes water quality contamination is improving. Nevertheless, contaminants from air, wastewater, and runoff from non-point sources continue to impact water quality in the lakes. In addition, concentrations of new chemicals that have the potential to cause harm have recently been detected, and are being labeled “chemicals of emerging concern”.³ Some localized toxic contamination continues to exist in high levels in Areas of Concern (*see below*).

Human Health: Human health can be impacted through Great Lakes water quality via drinking water, beaches, and consumption of fish. Overall, the SOLEC report characterizes its human health category as mixed, and that the trend over time is undetermined. The SOLEC report rates the quality of municipally-treated drinking water as good across all the lakes. This level of drinking water quality has remained unchanged over time. The report rates beaches on Lakes Superior and Huron as good, and the beaches on the remaining lakes as fair. Beach postings, advisories, or closures are due to the presence of *E. coli* bacteria (from both human and wildlife waste), poor water quality, or algae abundance. The trend for all lakes besides Lake Huron is undetermined. Lake Huron beach rating has remained unchanged. Contaminants in fish have generally decreased over time. Where the United States uses polychlorinated biphenyls (“PCBs”) for consumption advisories in Great Lakes fish, Ontario also uses mercury and dioxins.

Biotic Communities: The SOLEC report refers to the biological components of the Great Lakes ecosystem as “biotic communities”. It characterizes the current state of biotic communities across the lakes as mixed. While contaminant levels have decreased, the report notes that many biological components of the ecosystem are “severely stressed”. The trend for the overall health of biotic communities across the lakes is undetermined. In all of the Great Lakes, except for Lake Superior,

¹ SOLEC rates conditions according to five categories: Good – The state of the ecosystem component is presently meeting ecosystem objectives or otherwise is in acceptable condition; Fair – The ecosystem component is currently exhibiting minimally acceptable conditions, but it is not meeting established ecosystem objectives, criteria, or other characteristics of fully acceptable conditions; Poor – The ecosystem component is severely negatively impacted and it does not display even minimally acceptable conditions; Mixed – The ecosystem component displays both good and degraded features; Undetermined – Data are not available or are insufficient to assess the status of the ecosystem component.

² SOLEC rates trends according to four categories: Improving – Information provided shows the ecosystem component to be changing toward more acceptable conditions; Unchanging – Information provided shows the ecosystem component to be neither getting better nor worse; Deteriorating – Information provided shows the ecosystem component to be departing from acceptable conditions; Undetermined – Data are not available over time, so no trend can be identified.

³ According to Environment Canada, some 70,000 commercial and industrial compounds are currently in use, and 1,000 new chemicals are produced every year. EPA and Environment Canada have categorized some of these chemical categories as ‘chemicals of emerging concerns.’ These include polybrominated diphenyl ethers (flame retardants), various pharmaceutical and personal care products, and approximately 20 currently-used pesticides.

species at the bottom of the food chain (for example, *diporeia* and zooplankton) and native preyfish (walleye, lake sturgeon, lake trout) are declining. In Lake Superior, *diporeia* levels are unchanged. Great Lakes amphibians and wetland-dependent bird populations are either unchanged or in decline. The SOLEC report attributes these population reductions to habitat loss and deterioration.

Invasive Species: The SOLEC report rates all of the Great Lakes as poor in terms of invasive, or non-native, species introductions and impacts. This rating is worse than previous levels. The SOLEC report notes that 183 aquatic and 124 terrestrial non-native species have become established in the Great Lakes basin. These invasive species are considered by EPA and Environment Canada to be one of the greatest threats to biodiversity and natural resources of the region.

Coastal Zones and Aquatic Habitats: The Great Lakes coastal zones are subject to a variety of human and natural stressors including agriculture, residential development, point and non-point pollution, and weather patterns. The SOLEC report characterizes the health of coastal zones as mixed. Coastal habitats and wetlands are degraded in coastal zones due to development, replacing natural coastline with non-permeable materials like concrete, and the establishment of non-native species. The Great Lakes coastline includes more than 494,000 acres of coastal wetlands. However, this is less than one-half of the number of acres that existed prior to European settlement of the basin. A 2004 inventory of Great Lakes coastal wetlands did indicate, however, that Lakes Huron and Michigan still have extensive wetlands.

Resource Utilization: Water withdrawals have decreased since 1980 due to the shutdown of some nuclear power plants and increased efficiency at other power plants. However, overall energy consumption is increasing due to increased populations and low-population density development throughout the Great Lakes basin. Additional development will also result in increased water demand. Increased water withdrawals in combination with low lake levels could result in increased stresses on the Great Lakes water resources.

Lake levels across the Great Lakes have decreased in recent years. In August 2007, Lake Superior's levels approached record low-levels. Lake levels do fluctuate, however. In the 1980s, record high-levels were reached as a result of extreme rainfall during that decade. The National Oceanic and Atmospheric Administration ("NOAA") finds that low-lake levels are caused in part by increased atmospheric temperatures that lead to less frozen water resulting in increased winter evaporation, and less overall snowpack yielding decreased spring runoff. NOAA also notes that increased dredging of canals and rivers around the Great Lakes could result in higher rates of water running out of the lakes.

Land Use-Land Cover: Land use and cover impacts Great Lakes water quality, as well as biological productivity, biodiversity, and the regional economy. The SOLEC report rates the Land Use-Land Cover category as mixed. Forest coverage in the area buffering surface waters increases capacity for the watershed to maintain biodiversity, store water, regulate water temperatures, and limit nutrient and sediment loadings (nonpoint source pollution). Urbanization, seasonal home construction, and recreational use have increased the demands placed on forest resources in these areas. As a result, water quality has been impacted. However, an increase in sustainable forestry programs has resulted in an improved soil and water resource protection.

Climate Change: The SOLEC report did not produce a qualitative assessment of the Climate Change indicator category because indicators were incomplete at the time of report production. The

report does note that some observed changes in the Great Lakes region have been attributed to climate change. These include: shorter winters; warmer annual temperatures; more frequent extreme heat events; decreased duration of lake ice cover (due to air and water temperature increases); and more common heavy precipitation (snow and rain) events. The report also notes that lake levels are expected to decrease. Decreased lake levels could impact shipping, and increase the need for dredging.

Programs to Protect Water Quality in the Great Lakes

The Federal Government, the States, and the Canadian government are each involved in a number of programs to protect and improve water quality in the Great Lakes basin. Among these programs are more than 115 Federal programs that are nationwide in scope that can be used to support environmental restoration activities in the Great Lakes basin. Canadian and U.S. efforts to clean up the Great Lakes are guided by the Boundary Waters Treaty of 1909 and the 1987 Great Lakes Water Quality Agreement.

EPA, NOAA, the Natural Resources Conservation Service (“NRCS”), and the Fish and Wildlife Service (“FWS”) all have programs involving water quality protection and environmental restoration across the Great Lakes.

EPA: EPA’s work in the Great Lakes is handled through its Great Lakes National Program Office (“GLNPO”). GLNPO is structured to bring together federal, state, tribal, local, and industry actors using an integrated, ecosystem approach to protect, maintain, and restore the Great Lakes basin.

Two of EPA’s major water quality and environmental restoration initiatives are programs under the Great Lakes Legacy Act and the Great Lakes Initiative.

High concentrations of toxic substances remain in a number of localized settings across the Great Lakes. These toxic substances are often the historical, or legacy, remnants of former industrial pollution. While the discharge of these pollutants has largely ceased, these historical pollutants have contaminated sediment in those areas. They include PCBs, heavy metals, and polycyclic aromatic hydrocarbons (“PAHs”). These sites have been identified and labeled as Areas of Concern (“AOCs”). Forty-three AOCs are located across the Great Lakes, including 31 AOCs in United States territory.

To address these AOCs, the Great Lakes Legacy Act (“GLLA”) was signed into law in 2002. The GLLA provides funding to take the necessary steps to clean up contaminated sediment in U.S. AOCs. The GLLA provides funding for remediation, public outreach, and research. The GLLA authorized \$270 million over 5 years.⁴ The program received \$29.6 million in fiscal year 2007. The EPA’s Great Lakes National Program Office was designated to implement the GLLA.

Three of the 31 U.S. AOCs have been remediated under the GLLA. These include Black Lagoon, Michigan (Nov. 2005), Hog Island, Wisconsin (Nov. 2005), and Ruddiman Creek, Michigan (May 2006). Two remediation projects are currently underway: Ashtabula, Ohio, and Sault Ste. Marie, Michigan.

⁴ \$50 million per year for project (remediation and monitoring); \$3 million per year for research; \$1 million per year for outreach activities.

The Great Lakes Initiative (“GLI”) was created in 1995 to meet the goals of the GLWQA. It requires stringent water quality standards for many pollutants discharged into the Great Lakes. However, the primary focus of the GLI is on 22 bioaccumulative chemicals of concern (“BCCs”). These toxic pollutants include mercury, PCBs, and dioxin, among others.

A central component of the GLI is to promote consistent standards, implementation procedures, and National Pollutant Discharge Elimination System (“NPDES”) programs for point source discharges across all of six states in the Great Lakes basin. As authorized under the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants from any source into U.S. surface waters. Point sources are discrete conveyances such as pipes or constructed ditches. As of May 2005, nearly 5,000 facilities in the Great Lakes basin had NPDES permits. More than 500 of these facilities are classified as major source facilities.⁵

In July 2005, the Government Accountability Office (“GAO”) released a report that evaluated EPA’s GLI program.⁶ Chief among the findings of the report is that GLI has a limited ability to improve overall water quality in the Great Lakes basin. First, under certain circumstances, GLI allows States to use flexible implementation procedures, such as variances, when issuing permits for facilities. These variances allow the facilities to discharge pollutants at levels exceeding the stringent GLI water quality standards. As of July 2005, mercury was the only BCC with GLI permit limits. Those facilities with mercury variances could discharge mercury at levels that exceed the GLI mercury water quality standards. Second, the GLI focuses only on point source pollution. Nonpoint source pollution, from both atmospheric (air) deposition and agricultural runoff, is a greater source of water pollution in the Great Lakes. In its formal response to the 2005 GAO report, EPA highlighted that the Clean Water Act does not include a regulatory program for nonpoint source water pollution – therefore the GLI is unable to address this major source of water impairment.

In addition to a number of other findings, GAO also found that EPA was unable to sufficiently assess the impact of GLI with existing data sources, and has not gathered additional information to monitor progress.

NOAA: NOAA has a number of programs that concern Great Lakes water quality. The Great Lakes Environmental Research Laboratory (“GLERL”) is based in Ann Arbor, Michigan, and conducts physical, chemical, and environmental modeling research to provide scientific expertise and services to manage and protect ecosystems. NOAA is involved in the Great Lakes Restoration Project that acquires and restores critical habitat, implements storm water controls, and cleans contaminated sites along the five Great Lakes. NOAA also participates in Coastal Zone Management Programs that provides a basis for protecting, restoring, and responsibly developing the nation’s important and diverse coastal communities and resources.

⁵ Major dischargers include municipalities with capability to discharge greater than one million gallons per day and certain industrial facilities based on EPA and state ratings.

⁶ Government Accountability Office. 2005. *Great Lakes Initiative: EPA Needs to Better Ensure the Complete and Consistent Implementation of Water Quality Standards*. GAO-05-829. (July)

NRCS: NRCS is involved in a number of programs that lead to water quality protections. These include the Great Lakes Basin Program for Soil Erosion Sediment Control, the Environmental Quality Incentives Program, and the Wetland Reserve Program.

FWS: The FWS is involved in a number of programs that concern Great Lakes water quality and aquatic habitat protection. FWS Great Lakes programs include the Lower Great Lakes Lake Trout Restoration Program, Detroit River International Wildlife Refuge, and Fish and Wildlife Management Assistance - Great Lakes Operations.

AGENDA

PANEL I

The Honorable Peter J. Visclosky
The 1st District of Indiana

The Honorable Bart Stupak
The 1st District of Michigan

The Honorable Mark Steven Kirk
The 10th District of Illinois

The Honorable Rahm Emanuel
The 5th District of Illinois

PANEL II

Mr. David Maurer
Acting Director, Natural Resources and Environment
U.S. Government Accountability Office
Washington, DC

The Honorable Irene Brooks
International Joint Commission of the U.S. and Canada
Chair, United States Section
Washington, DC

Accompanied by:
Commissioner Allen I. Olson
International Joint Commission of the U.S. and Canada
United States Section
Washington, DC

PANEL III

The Honorable Benjamin H. Grumbles
Assistant Administrator for Office of Water
United States Environmental Protection Agency
Washington, DC

Accompanied by:

Ms. Mary A. Gade
Program Manager, Great Lakes National Program
United State Environmental Protection Agency
Washington, DC

Dr. Stephen B. Brandt
Director, Great Lakes Environmental Research Laboratory
National Oceanic and Atmospheric Administration
United States Department of Commerce
Washington, DC

Mr. Charles Wooley
Acting Regional Director, Midwest Region
U.S. Fish and Wildlife Service
United States Department of the Interior
Washington, DC

Ms. Christina Muedeking
Central Regional Assistant Chief, National Resources Conservation Service
United States Department of Agriculture
Washington, DC