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GAO

Report to the Chairman, Subcommittee
on Water Resources, Committee on
Public Works and Transportation,
House of Representatives

September 1990

WATER POLLUTION

Improved Coordination Needed to Clean Up the Great Lakes



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United States
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Resources, Community, and
Economic Development Division

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September 28, 1990

The Honorable Henry J. Nowak
Chairman, Subcommittee on
Water Resources
Committee on Public Works
and Transportation
House of Representatives

Dear Mr. Chairman:

As you requested, we have reviewed the progress the Environmental Protection Agency's (EPA) Great Lakes National Program Office has made in (1) defining its role within EPA and involving other EPA offices in implementing the Great Lakes Water Quality Agreement and (2) coordinating the efforts of other federal agencies. Our report also discusses other key issues affecting efforts to resolve the Great Lakes' water quality problems.

Unless you publicly release its contents earlier, we will make this report available to other interested parties 30 days after the date of this letter. At that time, we will send copies to the Administrator, Environmental Protection Agency; the Secretaries of the Army, the Interior, Agriculture, and Commerce; the Commandant, U.S. Coast Guard; the Director, Office of Management and Budget; and other interested parties.

This work was done under the direction of Richard L. Hembra, Director of Environmental Protection Issues, who may be reached at (202) 275-6111. Other major contributors are listed in appendix III.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

More than 45 million people from the United States and Canada rely on the Great Lakes for a variety of uses, including drinking water. However, the water quality of the Great Lakes and their tributaries has deteriorated over the years because of industrial development, urbanization, and agricultural activities. To deal with this problem, the U.S. and Canadian governments entered into the Great Lakes Water Quality Agreement in 1972. Later revisions strengthened the Agreement as awareness grew about the dangers of toxic pollutants in the lakes. The Environmental Protection Agency (EPA), through its Great Lakes National Program Office (Program Office), oversees and coordinates the fulfillment of the United States' obligations under the Agreement.

Reflecting concern about the ability of the Program Office to fulfill its mission, the Chairman, Subcommittee on Water Resources, House Committee on Public Works and Transportation, asked GAO to examine the progress the Program Office has made in (1) defining its role within EPA and involving other EPA offices in implementing the Agreement and (2) coordinating the efforts of other federal agencies. GAO also discusses other key issues affecting the Great Lakes' water quality.

Background

The Great Lakes Water Quality Agreement contains 17 annexes defining the specific programs and activities the two governments have agreed to undertake. A key annex calls for the preparation of plans to ensure that programs to rehabilitate the Great Lakes' water quality are developed and implemented. Remedial Action Plans define actions and timetables for restoring water quality in 42 "areas of concern" in the Great Lakes Basin of both the United States and Canada. The development of these plans involves all pertinent agencies, communities, and programs. Whereas these plans focus on specific near-shore areas, Lakewide Management Plans serve the same function for open lake waters.

In 1978, EPA's Region V (Chicago) office established the Program Office as the focal point to plan, coordinate, and oversee cleanup efforts by EPA divisions, other federal agencies, and the Great Lakes states. As GAO noted in a 1982 report on efforts to clean up the Great Lakes (CED-82-63, May 21, 1982), however, the Program Office was continually frustrated in its attempts to accomplish these objectives. GAO noted that the Program Office did not have a clearly defined role within EPA and that its contacts within EPA were largely limited to Region V, even though Regions II (New York) and III (Philadelphia) also had responsibilities regarding the Great Lakes. GAO also noted that the Program Office needed to improve its coordination with other federal agencies and states, and to solicit their support in implementing strategies for improving the Great Lakes' water quality.

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Reflecting similar concerns by the Congress, the Water Quality Act of 1987 formally required the Program Office to (1) identify problems regarding the Great Lakes, (2) coordinate the activities of organizations that could help solve these problems, and (3) report to the Congress on progress made in implementing the Agreement.

Results in Brief

In recent years, the Program Office has taken steps to improve its visibility and its coordinating role within EPA by expanding its contacts with both headquarters and regional offices. In addition, the Program Office established the Great Lakes Advisory Committee in 1989 to further improve coordination within EPA. The committee includes representation from all the key EPA offices having responsibilities that affect the water quality of the Great Lakes.

The Program Office has also improved its coordination with agencies outside EPA that can affect the Great Lakes' water quality. In particular, the Office reached agreement with other agencies on how to implement many of the annexes and established the U.S. Policy Committee—a group consisting of senior officials from many federal and state agencies and other groups—to advise the United States on how to best address the Agreement. While these efforts have helped to achieve progress on most of the annexes, the development of Remedial Action Plans and Lakewide Management Plans—key steps toward cleaning up the Great Lakes—is far behind schedule.

While improvements in the Program Office's operations should help, a much larger effort is needed to address the serious pollution problems affecting the Great Lakes. Even the difficult challenge of developing Remedial Action Plans and Lakewide Management Plans, which will involve substantial commitments of time and resources by many organizations, are just initial steps in planning the cleanup. Carrying the plans out will take decades and will require more effective pollution control programs by EPA and both the public and private sectors.

Principal Findings

Steps to Improve Internal EPA Coordination

The Program Office has taken several steps in recent years to improve coordination within EPA at both the regional and the headquarters level. At the regional level, the Program Office has (1) expanded its contacts

with Regions II and III and (2) increased its funding of Region II projects, thus attempting to change the perception within EPA that the Program Office is merely an extension of Region V. At the headquarters level, the Program Office has worked with the Office of Marine and Estuarine Protection and individual estuary programs to help develop policies and activities directly affecting the Great Lakes. It has also entered into agreements with EPA's Office of Research and Development to fund a variety of research projects on the Great Lakes.

Nevertheless, greater coordination with other headquarters offices was needed, since the Program Office's mandate was to develop a comprehensive "ecosystem" approach that considers all sources of pollution affecting the Great Lakes. Accordingly, the Office established the Great Lakes Advisory Committee in 1989. While the number of headquarters offices with key programs affecting the Great Lakes was initially limited, the Administrator added other key EPA offices in April 1990. The Office of Air and Radiation was added, for example, because the atmosphere contributes toxic chemicals to the Great Lakes.

Enhanced Coordination in Plan Development Is Needed

Improved coordination and cooperation between the Program Office and other federal agencies have resulted in progress in meeting many of the Agreement's annexes, including annexes intended to help resolve contaminated sediment, airborne toxic substances, and other problems. However, the completion of the most important and difficult annex, which calls for the development of Remedial Action Plans and Lakewide Management Plans, has been delayed for years.

Representatives from state and local agencies and public interest groups engaged in developing these key plans maintain that the Program Office needs to be more involved to speed their development. However, Program Office staff told us that while they are augmenting their role somewhat, (1) resource limitations prevent the Office from doing substantially more to advance these plans beyond providing basic guidance and some technical assistance, (2) the task is primarily a responsibility of state and local governments through implementation of their water pollution control programs, and (3) EPA's three Great Lakes regions should also play a larger role than they have in the past.

GAO believes that because of the importance of developing plans to clean up the Great Lakes—and the lack of progress in achieving this objective—these issues need to be resolved. The U.S. Policy Committee, created in 1989 to recommend ways to improve coordination and

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cooperation among federal and state agencies and environmental groups as they implement the Agreement, appears to be uniquely situated to help resolve this disagreement. Indeed, officials from the Program Office and other agencies who are members of the Committee told GAO that such a role would be appropriate for this newly formed Committee, since it already brings together the federal, state, local, and other interests that will ultimately be involved in cleaning up the Great Lakes. They also agreed that while the Committee was initially established by the Program Office, it operates with considerable independence, which would enhance the credibility of its recommendations.

Cleanup of the Great Lakes Will Be Costly

Even though progress has been made in completing the annexes, cleaning up the Great Lakes will be costly and will take well into the next century. The Program Office can play an important role in this effort by helping to coordinate the efforts of organizations at all levels of government and by providing direct technical support in certain instances. However, the Program Office's potential contribution should be evaluated in the context of the enormous task at hand. Illustrating the enormity of this task, a recent GAO report (GAO/RCED-88-164, Aug. 10, 1988) estimated that it would cost over \$1.8 billion to bring Michigan's Rouge River, one of the 42 areas of concern, up to public health standards by the year 2005. Realistically, therefore, success in cleaning up the Great Lakes will depend much more heavily on the level of commitment and resources the nation and the Great Lakes region are willing to devote to the effort.

Recommendations

To improve interagency coordination in dealing with the pollution problems of the Great Lakes, and in particular to speed progress on the development of Remedial Action Plans and Lakewide Management Plans, GAO recommends that the EPA Administrator request that the U.S. Policy Committee assess, identify, and recommend appropriate roles and responsibilities for the Program Office and other organizations in developing these plans.

Agency Comments

GAO discussed the information in this report with EPA officials, who generally agreed with its accuracy. Their comments have been included where appropriate. However, as requested, GAO did not obtain official comments on a draft of this report.

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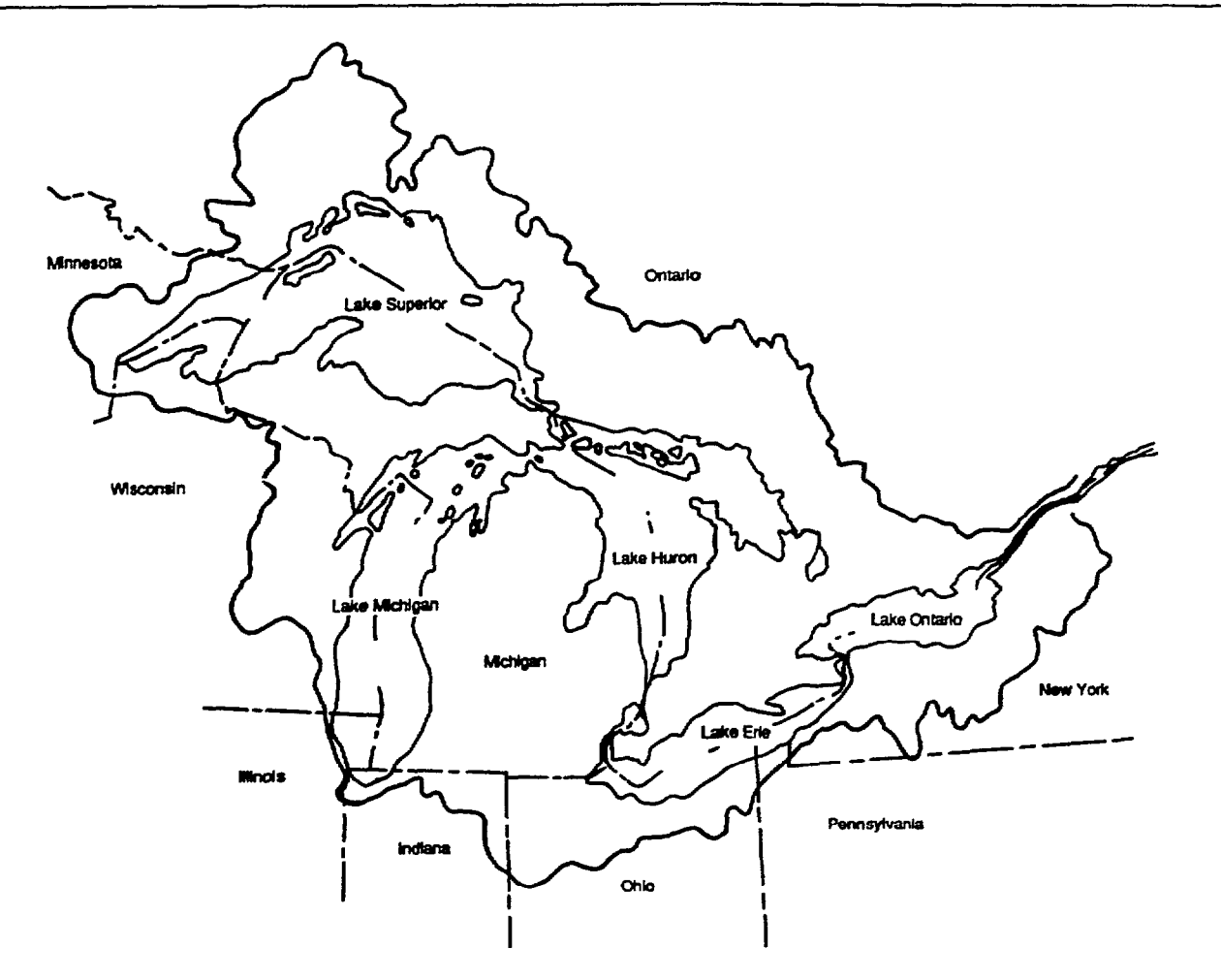
Abbreviations

DDT	dichlorodiphenyltrichloroethane
EPA	Environmental Protection Agency
GAO	General Accounting Office
GLNPO	Great Lakes National Program Office
IJC	International Joint Commission
LMP	Lakewide Management Plan
NOAA	National Atmospheric and Oceanic Administration
NPDES	National Pollutant Discharge Elimination System
PCB	polychlorinated biphenyl
RAP	Remedial Action Plan

Introduction

The five Great Lakes—Superior, Michigan, Huron, Erie, and Ontario—
together form the largest freshwater system on earth. The Great Lakes
represent 20 percent of the world's and 95 percent of the United States'
supply of fresh water. Approximately 23.5 million people use 3 billion
gallons of fresh water each day from the Great Lakes for domestic pur-
poses. In addition, more than 45 million people in two Canadian prov-
inces and eight U.S. states rely on the Great Lakes for economic,
recreational, and aesthetic benefits (see fig. 1.1).

Figure 1.1: The Great Lakes Basin



Water Quality Problems in the Great Lakes

Years of urbanization, industrial development, and agricultural activities have impaired the water quality of the Great Lakes. While progress has been made in alleviating certain problems, concerns over high levels of toxic contaminants found in the lakes raise serious questions about their future.

The most significant improvement in the Great Lakes' water quality in recent years resulted from reductions in phosphorus contamination. Phosphorus causes excessive algae growth, which greatly reduced the fish populations in the Great Lakes. In fact, at the peak of the phosphorus problem, scientists feared that parts of Lake Erie would no longer be able to support fish life. However, the construction of sewage treatment plants, reduction of phosphates in detergents, and control of runoff from rural and urban areas around the Great Lakes significantly reduced the level of phosphorus.

The phosphorus problem, however, increased concern for the Great Lakes and led the way to an awareness of the dangers posed by toxic contaminants. Toxic contaminants come from many sources and are more difficult to detect than phosphorus. Furthermore, many of the effects of toxic contaminants, and the best ways to reduce their presence, are still unknown. However, scientists do know that these substances pose significant threats to wildlife and human health. Many species in the Great Lakes have been harmed or eliminated, including bald eagles, gulls, and otters. Regarding human health, alarming results were reported from a recent study on long-term exposure to low levels of toxic substances. The study concluded that babies born to mothers who ate contaminated fish from the Great Lakes are more likely to be born prematurely, weigh less, have smaller head sizes, and exhibit slower emotional responses than babies whose mothers ate little or no contaminated fish. In addition, other research studies on human health indicate adverse effects from eating fish from the Great Lakes, including the increased risk of cancer.

Great Lakes Water Quality Agreement and Subsequent Provisions

In 1909, recognizing their mutual interests in the Great Lakes and other boundary waters, the United States and Canada signed the Boundary Waters Treaty, which gave both countries equal rights to use the waterways that cross the international border. The Treaty also established the International Joint Commission (IJC), a permanent binational agency organized to resolve and prevent disputes concerned with the waters along the Canada-United States border.

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An increased concern over contaminants in the Great Lakes prompted both the U.S. and Canadian governments to sign the first international Great Lakes Water Quality Agreement in 1972 to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes. The Agreement focused on controlling pesticides as a principal means of dealing with toxic pollution.

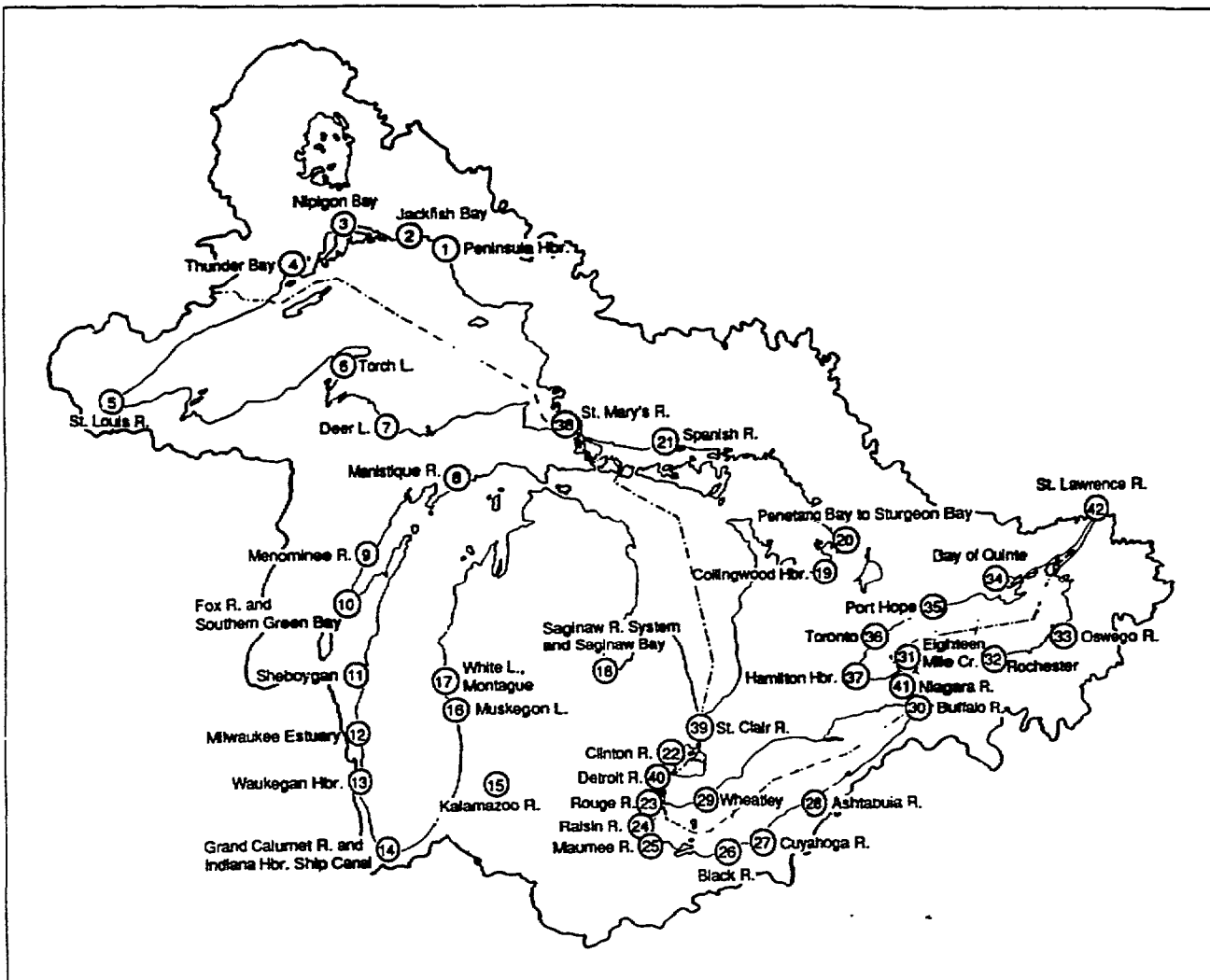
The two countries signed a new Great Lakes Water Quality Agreement in 1978, which was revised in 1983. The 1978 Agreement reflected an increased understanding of the scope of pollution problems in the Great Lakes. It called for (1) controlling all toxic substances that could endanger the health of any living species and (2) restoring and enhancing water quality throughout the entire Great Lakes Basin. The 1983 supplement added the requirement to further limit phosphorus discharges and prepare and implement plans for reducing phosphorus.

Revisions to the Agreement in 1987 added requirements for the two countries to prepare Remedial Action Plans (RAPs) to address pollution problems in certain designated "areas of concern." Areas of concern are geographic areas in the Great Lakes Basin that have failed to meet the objectives of the Great Lakes Water Quality Agreement and where such failure has caused, or is likely to cause, impairment of beneficial uses. IJC has identified 42 such areas in the Great Lakes Basin—25 in the United States, 5 shared by the United States and Canada, and 12 in Canada (see fig. 1.2).

RAPs were to define actions and timetables for restoring water quality in these areas. Similar plans—Lakewide Management Plans (LMPS)—were to serve the same purpose for open lake waters. LMPS were to be prepared by the two countries for each of the five lakes, except for Lake Michigan, which is the United States' responsibility. In preparing LMPS, the two countries were to consult with state and provincial governments. In the United States, the Environmental Protection Agency (EPA) has been charged with the responsibility of carrying out the nation's role in developing and implementing LMPS.

In addition to requiring RAPs and LMPS, the Agreement contains 16 other "annexes," which define issues to be addressed and activities to be conducted by the two governments. These annexes address such issues as airborne toxic substances, contaminated sediment, and control of phosphorus.

Figure 1.2: Areas of Concern in the Great Lakes Basin



Creation of EPA's Great Lakes National Program Office

In 1972, EPA's Region V (Chicago) established the Office of Great Lakes Coordinator to monitor a demonstration program on the water quality of the Great Lakes and to conduct research on the Red River (which crosses the international boundary between Ontario and Minnesota). The Office operated with three technical staff and one secretary. In 1978, EPA's Region V established a larger coordinating office, the Great

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Lakes National Program Office (GLNPO), to direct and oversee fulfillment of the nation's obligation under the Agreement and any spending for that purpose.

In 1982, we reported that GLNPO was having difficulty obtaining the cooperation it needed from EPA offices and other federal and state agencies to fulfill its mission.¹ Specifically, GLNPO did not have the visibility, authority, and resources necessary to ensure that its Great Lake Water Quality Program could compete with other national programs. One of our recommendations was that GLNPO be allowed to coordinate actions within EPA and with other federal agencies and the states to ensure that their views were included in the development of strategies to improve the Great Lakes' water quality.

In the years following our report, however, the Administration attempted to eliminate GLNPO by excluding it from the Administration's budget proposal. The Administration saw the problems regarding the Great Lakes as regional concerns and believed that the states and EPA regions should be responsible for addressing those problems. However, each time the Administration excluded GLNPO, the Congress restored funding for the Office and EPA's Region V provided staff and other support.

In 1987, under the Water Quality Act, the Congress formally established a statutory mandate for GLNPO and gave the Office responsibility for developing and implementing plans to carry out the Agreement. Specifically, the act required GLNPO to

- cooperate with federal and state agencies in developing and implementing plans to carry out the United States' responsibilities under the Agreement;
- coordinate EPA's efforts to improve the water quality of the Great Lakes;
- monitor the water quality of the Great Lakes;
- serve as a liaison with Canada;
- coordinate EPA's efforts with those of other federal agencies, as well as those of state and local agencies, to obtain the views of these agencies in developing strategies for improving water quality and their support in achieving the objectives in the Agreement; and
- report annually to the Congress on the state of the lakes and on progress in meeting the United States' obligations under the Agreement.

¹ A More Comprehensive Approach Is Needed to Clean Up the Great Lakes (CED-82-63, May 21, 1982).

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As presently structured, GLNPO is a unique entity within EPA because it is associated with a specific area of the country but operates as a functional part of the Office of Water at EPA headquarters. It does not have authority over other EPA offices, but rather coordinates the activities of other offices and helps to ensure that matters concerning the Great Lakes are considered in the agency's policy and program decisions. GLNPO currently has a staff of about 30 scientists, engineers, and other professionals who work with offices throughout EPA, the Great Lakes states, other federal agencies, the Canadian government, the Ontario Provincial Government, IJC, colleges and universities, and public interest organizations. It is organized into the Surveillance and Research Staff, the Environmental Planning Staff, and the Remedial Program Staff. Each participates in, coordinates, and facilitates actions by the majority of these organizations to ensure that environmental management decisions concerning the Great Lakes Basin reflect the Agreement's objectives. (See app. I for an organizational chart on the structure of GLNPO and its coordination activities.)

GLNPO formally coordinates EPA's activities concerning the Great Lakes primarily through two committees:

- The Great Lakes Coordinating Committee was established in 1980 to (1) serve as an intra-agency forum for EPA's three Great Lakes regions and EPA's Office of Research and Development and (2) review and recommend proposed demonstration and research projects to be funded by GLNPO.
- The Great Lakes Advisory Committee was established in 1989 primarily to coordinate activities between GLNPO and EPA's headquarters offices.

The Coordinating Committee supports the Advisory Committee in a number of functions, including the determination of GLNPO's budget and work plan.

In addition, GLNPO created the U.S. Policy Committee in 1989 to improve coordination and cooperation between EPA and other federal agencies, and to improve contacts with state agencies, environmental groups, and other interested parties. The Committee meets twice a year, just before the semiannual meeting between the United States and Canada. It focuses on what the United States' position should be on policy and issues regarding the Great Lakes.

Objectives, Scope, and Methodology

Expressing concerns over GLNPO's effectiveness, the Chairman, Subcommittee on Water Resources, House Committee on Public Works and Transportation, requested that we evaluate a number of issues affecting the ability of GLNPO to meet its responsibilities under the Water Quality Act. On the basis of subsequent meetings with the Chairman's office, we agreed to assess the progress GLNPO has made in

- defining its role within EPA and involving other appropriate EPA offices in meeting the objectives of the Agreement and the 1987 Water Quality Act, and
- coordinating the efforts of other federal agencies and state and local governments in addressing the objectives of the Agreement and its annexes.

To address the first objective, we identified GLNPO's efforts to involve other EPA offices through projects, intra-agency agreements, and intra-agency committees. In assessing the effectiveness of these efforts, we reviewed information from GLNPO; EPA headquarters offices (Air and Radiation, Water, Research and Development, and International Affairs); and EPA Water Division Offices in Regions II, III, and V (New York, Philadelphia, and Chicago, respectively). The key information we reviewed included GLNPO's workplan for achieving the objectives of the Great Lakes Water Quality Agreement; funding agreements for research and other activities between GLNPO and other EPA offices; and the membership, objectives, and accomplishments of the committees established to improve intra-agency coordination.

To address the second objective, we collected information from federal agencies (National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, Soil Conservation Service, U.S. Fish and Wildlife Service, U.S. Coast Guard, and U.S. Geological Survey) and lead state agencies for the Great Lakes. The information included views of cognizant officials at these agencies on GLNPO's appropriate role and on how well GLNPO is coordinating programs regarding the Great Lakes. We also spoke to GLNPO officials to obtain their views on how they are, and should be, working with these federal agencies to implement the Agreement (e.g., through interagency agreements and funding of agencies' research proposals).

We also selected several of the Agreement's annexes to assess GLNPO's effectiveness in coordinating the implementation of the Agreement's key requirements by federal agencies. We chose annex 7 (dredging), annex

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11 (surveillance and monitoring), and annex 15 (airborne toxic substances) for our review because GLNPO staff said they had made the most progress on these annexes. We chose annex 14 (contaminated sediment) because it included the Assessment and Remediation of Contaminated Sediment Program, which GLNPO was directed to develop and implement. We chose annex 2 (RAPS and LMPS) because it addresses cleaning up all sources of water pollution and involves the coordination and cooperation of many agencies.

We spoke with several environmental groups, such as Great Lakes United and the Sierra Club, to obtain their views on how well GLNPO was coordinating federal and state efforts to address the Great Lakes Water Quality Agreement and meet the requirements of the 1987 Water Quality Act. We also gathered information from the Northeast-Midwest Institute and reexamined data from our own recent analysis of pollution in the Rouge River² to help determine the potential costs of cleaning up the Great Lakes.

Our evaluation focused on GLNPO's role in coordinating the United States' efforts to meet the objectives of the Great Lakes Water Quality Agreement. We did not attempt to evaluate the role of Canada or its progress in cleaning up the Great Lakes or in implementing the Great Lakes Water Quality Agreement.

We conducted our work between May 1989 and March 1990, with updates through July 1990, in accordance with generally accepted government audit standards. During our review, we sought the views of GLNPO and other EPA officials responsible for activities concerning the Great Lakes, and their comments have been incorporated where appropriate. However, in accordance with the wishes of the Chairman's office, we did not request formal comments from EPA on a draft of this report.

²Water Pollution: Efforts to Clean Up Michigan's Rouge River (GAO/RCED-88-164, Aug. 10, 1988).

Steps Taken to Improve GLNPO's Coordination Within EPA

Since the 1987 Water Quality Act was passed, GLNPO has augmented its profile within EPA by participating in the development of EPA's water policy, expanding its contacts beyond Region V (Chicago) to include Regions II (New York) and III (Philadelphia), devising a workplan for programs concerning the Great Lakes, and funding EPA regions' water pollution projects for the Great Lakes. GLNPO also established the Great Lakes National Program Advisory Committee, composed of representatives of EPA's three Great Lakes regional offices and all key headquarters offices with programs affecting the lakes' water quality. The Advisory Committee helps to coordinate and review EPA's policies and activities regarding the lakes and recommends which projects to fund. In April 1990, EPA expanded the composition of the Advisory Committee, a step that should further increase GLNPO's effectiveness in coordinating EPA's activities to improve the Great Lakes' water quality.

GLNPO's Role Within EPA Expanded by 1987 Water Quality Act

In 1982, we reported to the Congress that GLNPO's narrow role within EPA hurt the Office's ability to implement the Great Lakes Water Quality Agreement. EPA Regions II and III were reluctant to commit resources to initiatives regarding the Great Lakes because they did not receive specific funding for such purposes. In addition, GLNPO had not delegated any responsibilities to Regions II and III. As a result, implementation of the Great Lakes Water Quality Agreement was largely left to GLNPO and Region V. To ensure that GLNPO could more effectively fulfill its leadership role, we recommended that the EPA Administrator raise GLNPO to a higher organizational level and give it the authority and resources necessary to coordinate EPA actions aimed at improving the Great Lakes' water quality.

It was not until the Water Quality Act of 1987, however, that progress was made toward addressing the issues identified in our 1982 report. At that time, the Congress assigned GLNPO an organizational identity within EPA, giving GLNPO its own budget, and charged it with developing an "ecosystem approach" (i.e., an approach that would address pollution problems in the entire Great Lakes Basin and consider all sources of pollution), as envisioned in the Agreement. The act also required GLNPO to coordinate EPA headquarters and regional programs for improving the water quality of the Great Lakes. As discussed below, we found that since the act's passage, GLNPO has taken steps to increase its involvement with EPA headquarters and regional offices responsible for the Great Lakes.

Efforts Made to Improve Coordination With EPA Headquarters

The Agreement's emphasis on an ecosystem approach to environmental management necessitated that GLNPO be concerned with all types of environmental management decisions involving the Great Lakes Basin. Consequently, GLNPO needs to coordinate activities at the national level with many of EPA's media programs, including programs for surface water, groundwater, drinking water, air, hazardous waste, Superfund, toxic substances, and pesticides. For example, the Office of Air and Radiation has jurisdiction over programs dealing with pollutants transported from other geographical areas through the atmosphere, a major contributor of certain toxic chemicals in the Great Lakes. Similarly, the Office of Pesticides and Toxic Substances regulates the use of pesticides to reduce the amount of toxic substances entering the Great Lakes from storm water runoff.

Thus far, GLNPO has made inroads with some of the key EPA headquarters offices. In fiscal year 1989, GLNPO began working with EPA's Office of Marine and Estuarine Protection and individual estuary programs to support the development of policies and programs that address pollution problems in the Great Lakes. For example, GLNPO is working with the Office of Marine and Estuarine Protection to develop a method to share new technological developments. In fiscal year 1988, GLNPO entered into an agreement with the Office of Research and Development's Environmental Research Laboratory in Duluth, Minnesota, to fund research on the Great Lakes at the Laboratory and its Large Lakes Research Station in Grosse Ile, Michigan. The Research Station and Laboratory are assisting GLNPO with its mass balance model in Green Bay, Wisconsin, and the Assessment and Remediation of Contaminated Sediment Program¹ — models for the removal, stabilization, or treatment of toxic sediments. The Green Bay Mass Balance Study will also be used as a tool to develop LMPS.

Nevertheless, GLNPO recognized that it needed to increase its efforts to involve headquarters offices if it was to succeed in developing the ecosystem approach mandated by the Water Quality Act. As noted above, coordination with EPA headquarters offices, such as the Office of Air and Radiation and the Office of Pesticides and Toxic Substances, is crucial to addressing pollution problems in the Great Lakes.

¹The Assessment and Remediation of Contaminated Sediment Program stems from the 1987 Water Quality Act requirement for GLNPO to conduct 5-year study and demonstration projects on the control of toxic pollutants in sediments in the Great Lakes.

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To assist in this effort, GLNPO established the Great Lakes Advisory Committee in 1989 "to address policy issues and headquarters level coordination." In particular, the committee (1) reviews GLNPO's yearly budget, (2) addresses multimedia policy issues regarding the Great Lakes, and (3) reviews GLNPO's and headquarters' activities pertaining to the Great Lakes, including their funding and milestones.

Committee members initially included GLNPO's former Director; Regional Administrators from Regions II, III, and V; and Assistant Administrators from EPA's Office of Research and Development, Office of International Activities, and Office of Water. GLNPO's Deputy Director stated that these members were invited to the first meeting in March 1989 because they were the most active in implementing the Great Lakes Water Quality Agreement. He told us, however, that it was important for other offices to participate in subsequent committee deliberations, given their responsibilities for key issues and programs affecting the Great Lakes. He specifically noted that the Office of Air and Radiation and the Office of Solid Waste and Emergency Response should participate because both offices had expanded their original duties and responsibilities regarding the Great Lakes.

In its January 1990 meeting, the Great Lakes Advisory Committee members determined that to satisfy the requirements of the Great Lakes Water Quality Agreement, more direct participation was needed from all EPA offices. The Administrator responded to this concern in an April 1990 memorandum, stating that the membership of the committee would be expanded to include all Assistant Administrators and that the EPA Deputy Administrator would be the Chairman. He also requested that each Assistant Administrator review his or her programs and funding policies and, by May 1990, advise the Great Lakes Advisory Committee of the specific contributions their office could make toward a coordinated, multimedia approach to environmental problems in the Great Lakes. In addition, he requested that each office designate a senior-level contact to provide day-to-day communication with GLNPO.

**EPA Regional
Involvement Has
Expanded and
Improved**

Most of GLNPO's contacts with EPA regions have focused on funding research projects that identify the nature and extent of pollution problems or that seek to develop innovative ways to address such problems. GLNPO established the Great Lakes Coordinating Committee in 1980 to coordinate these activities with the three Great Lakes regions, and to review and recommend proposed research projects to be funded by GLNPO. The committee membership consists of six Division Directors

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from Region V, the Director from Region II's Environmental Services Division, the Director from Region III's Water Division, a representative from EPA's Environmental Research Laboratory (a research office used heavily by GLNPO), a representative from the Office of Marine and Estuarine Protection, and GLNPO's Director and Deputy Director.

The committee's funding recommendations have largely been based on how well they help the United States meet its commitments under the Great Lakes Water Quality Agreement. According to one member, GLNPO generally follows the committee's recommendations. The available funds range between \$1 million and \$5 million each year, depending on GLNPO's appropriations, fixed costs, and congressionally mandated projects, such as the Assessment and Remediation of Contaminated Sediment Program.

While the committee was intended to help GLNPO coordinate these activities with all the Great Lakes regions, Region V had received most of the funding from GLNPO until recently. The emphasis on Region V reinforced a view within EPA that GLNPO was largely an appendage of Region V, rather than a headquarters office with broader relationships within the agency.

In recent years, however, GLNPO has taken several steps to improve coordination and cooperation with Regions II and III. For example, in 1989 the committee recommended and GLNPO approved funding for Region II's Niagara River Toxic Assessment Program, which screens and quantifies toxic chemicals. The information developed in the program will be helpful in developing an LMP for Lake Ontario. Region II also received GLNPO funds to set up workshops, reserve meeting rooms, and send out mailings to encourage public involvement in developing LMPs.

Before fiscal year 1989, Region III had not received funding from GLNPO, but the Region's Water Division Director explained, and GLNPO officials agree, that GLNPO funding would be considered unnecessary because of the region's limited jurisdiction over the Great Lakes—approximately 40 miles of Lake Erie's shoreline. During fiscal year 1989, GLNPO tried to transfer funds to Region III to support a study of Presque Isle Bay at Erie, Pennsylvania, which LIC had recommended to be named an area of concern. Because Region III did not have a system in place to transfer funds to a state, GLNPO gave the funds directly to Pennsylvania for the study. However, Region III and GLNPO have been trading research and other information because of Region III's involvement with the Chesapeake Bay, a body of water with some similarities to the Great Lakes.

**Chapter 2
Steps Taken to Improve GLNPO's
Coordination Within EPA**

Conclusions

Since our 1982 report, and particularly since passage of the 1987 Water Quality Act, GLNPO has taken steps to improve coordination of EPA's efforts to implement the Great Lakes Water Quality Agreement. GLNPO has invited officials from EPA headquarters and regions to participate in the Great Lakes Advisory Committee, and is developing a comprehensive workplan for the Great Lakes that would include participation from EPA headquarters and regions as well as from other federal and state agencies. In addition, GLNPO has expanded its relationship in recent years with Regions II and III, helping to change the perception within EPA that it is merely an extension of Region V.

Greater EPA Involvement Needed in Coordinating Remedial Action Plans

In addition to requiring GLNPO to coordinate EPA's own work to improve the Great Lakes' water quality, the Water Quality Act of 1987 required GLNPO to coordinate EPA's programs with those of federal, state, and local agencies in developing specific strategies for improving water quality. GLNPO has taken several steps to meet the act's requirements. For example, GLNPO staff have taken leadership roles in IJC, which reviews both the United States' and Canada's progress in implementing the Great Lakes Water Quality Agreement. In September 1989, GLNPO established the U.S. Policy Committee—consisting of federal agencies, states, and public interest groups—to determine U.S. policy in achieving the objectives of the Agreement. GLNPO has also made progress in coordinating activities among federal and state agencies to address specific annexes under the Agreement, such as developing inventories of airborne toxic substances and improving the surveillance and monitoring of the Great Lakes' water quality.

Although progress has been made in meeting many of the Agreement's objectives, the development of RAPS—a top IJC priority in addressing the Great Lakes' water quality problems—has fallen far behind schedule. State and local RAP officials, as well as environmentalists, believe that progress can be made only if GLNPO takes a more active role in developing RAPS. While GLNPO has augmented its coordinating role somewhat, and is considering further involvement, it maintains that the actual development of these detailed and complex cleanup plans is principally the responsibility of state and local governments and that EPA regions also should play a larger role.

GLNPO's Coordination with Other Agencies Initially Centered on IJC

In 1982, we reported that the United States needed to take a more comprehensive approach toward cleaning up the Great Lakes and meeting the objectives of the Agreement. We stated that GLNPO had been frustrated in its attempts to ensure that the United States' commitments under the Agreement were met because it could not direct the activities of other federal agencies or states. To help address the problem, we recommended that GLNPO coordinate with other federal agencies and states to obtain their views on strategies for improving the lakes' water quality and solicit their support in implementing those strategies.

In an attempt to improve its coordination and visibility, GLNPO became involved in IJC's activities, which involve staff from a variety of U.S. and Canadian federal agencies, as well as staff from state and provincial agencies. The Great Lakes National Program Manager served as the United States' cochairperson on IJC's Water Quality Board, and the

former GLNPO Director became the United States' cochairperson on IJC's Water Quality Programs Committee (which reports to the Water Quality Board). GLNPO's senior staff also chaired other IJC subcommittees.

GLNPO's former Director, however, became concerned that GLNPO staff were spending too much time on IJC's activities, particularly as chairpersons of various committees and subcommittees. She said that even though participation in IJC's activities helped her staff understand initiatives for the Great Lakes, they did not spend enough time on coordination with other U.S. federal agencies. GLNPO's Deputy Director agreed, indicating that as late as 1988, he was spending at least 50 percent of his time as chairman of an IJC subcommittee. Another GLNPO official said that he was spending 50 to 60 percent of his time as chairman of another subcommittee and that this participation adversely affected his ability to coordinate the activities of U.S. agencies.

As a result of these concerns, GLNPO staff plan to relinquish their positions as chairpersons, asking staff from EPA regional offices, other U.S. agencies (e.g., the Fish and Wildlife Service), or the Great Lakes states to fill these positions. GLNPO intends to keep its staff involved with IJC's activities, but not as chairpersons of the committees and subcommittees.

3. Policy Committee Established to Improve Interagency Coordination

As part of its effort to improve coordination and cooperation among federal and state agencies and environmental groups, GLNPO established the U.S. Policy Committee, with GLNPO's Director as the Chairperson in 1989. The Committee is required to meet twice a year—and more often if the members desire—just before each semiannual meeting between the United States and Canada to decide what the United States' position should be on policies and issues regarding the Great Lakes.

The Committee met for the first time in September 1989. A wide range of organizations are represented on the committee, including GLNPO; EPA Regions II, III, and V; other federal agencies with responsibility for the Great Lakes (e.g., U.S. Coast Guard, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and National Oceanic and Atmospheric Administration); the eight Great Lakes states; public interest groups; and industry. The Committee's objectives include identifying

- key provisions of the Great Lakes Water Quality Agreement that require the coordinated efforts of more than one agency or program and the steps needed to implement these provisions,

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- situations in which Agreement revisions are not being met because of a lack of adequate coordination, and
- situations in which one or more organizations did not implement the Agreement because they did not give it sufficient priority.

Although the Committee was established by GLNPO, it represents diverse interests and expertise from a variety of governmental and nongovernmental organizations. One member of the Policy Committee told us that he was particularly impressed with the caliber of the participants at the September 1989 meeting and that the GLNPO staff has been committed to motivating other federal agencies to make greater commitments in resolving issues regarding the Great Lakes. He added, however, that most agencies have limited resources and will therefore not be able to do everything that GLNPO suggests.

Other members of the U.S. Policy Committee—including state, industry, federal agency, and environmental group members—told us that although GLNPO organized the Committee, it operates independently of GLNPO and can make important policy decisions without undue pressure or influence from the Office. Furthermore, these members noted that while GLNPO's Director presently chairs the Committee, nothing precludes a member from another agency from becoming the Committee's chairperson in the future.

GLNPO Has
Not Been
Coordinated With
States and Other
Agencies in
Implementing
Annexes, but Key
Issues Are Behind
Schedule

Improved coordination and cooperation between GLNPO and states and other federal agencies have resulted in progress in implementing many of the Agreement's annexes. However, implementation of the most important and difficult annex, calling for the development of RAPS and LMPs, has been delayed for years.

Implementing the annexes often requires actions by one or more federal agencies or states. GLNPO, as the lead federal office in ensuring that the United States fulfills the terms of the Great Lakes Water Quality Agreement, including the annexes, must rely on cooperation from states and from other agencies because it is not funded to directly implement the Agreement and does not have the resources to accomplish the objectives on its own. In 1989, GLNPO began developing a workplan listing (1) current EPA regional programs that address each annex of the Agreement and (2) EPA regional offices that should assist GLNPO in implementing these programs. GLNPO plans to expand the workplan in 1990 to include all federal, state, and local agencies that also should provide assistance.

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Fifteen of the 17 annexes address specific functional topics, such as the control of phosphorus going into the Great Lakes, the surveillance and monitoring of the Great Lakes' water quality, and pollution from contaminated groundwater. The other two annexes call for the development of (1) specific objectives regarding water quality (e.g., which pollutants should be regulated and what their allowable limits should be) and (2) RAPS and LMPs. GLNPO has been coordinating with states and with other federal agencies to implement the objectives of the annexes. To illustrate:

- Annex 3 (control of phosphorus). GLNPO and the Department of Agriculture's Soil Conservation Service jointly developed and implemented a series of demonstration projects to reduce the amount of phosphorus entering the Great Lakes.
- Annex 7 (dredging). GLNPO has been helping IJC maintain a register of dredging projects, as required by the annex, and uses information provided by the U.S. Army Corps of Engineers to update its register.
- Annex 11 (surveillance and monitoring). GLNPO has cooperated with the U.S. Fish and Wildlife Service and the states to monitor the quality of open lake and coastal waters. GLNPO also has an agreement with the National Oceanic and Atmospheric Administration and the U.S. Fish and Wildlife Service to do joint field monitoring with EPA for the Green Bay Mass Balance Study.
- Annex 14 (contaminated sediment). GLNPO has begun to determine methods for assessing and reducing contaminated sediment. GLNPO has an interagency agreement with the U.S. Army Corps of Engineers, the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, and the U.S. Bureau of Mines to plan a demonstration program. GLNPO also has an agreement with five states and several universities to help plan and design the program.
- Annex 15 (airborne toxic substances). GLNPO has an agreement with the governors of all eight Great Lakes states to help develop emission inventory procedures for toxic emissions. As part of this effort, GLNPO has built five monitoring stations and plans to build 12 more by 1993.
- Annex 16 (pollution from contaminated groundwater). GLNPO has worked with the U.S. Geological Survey to study the effects of contaminated groundwater on the Great Lakes.

opment of RAPS
; to Be Better
inated

One of the most important annexes in eliminating persistent toxic substances in the Great Lakes is annex 2, the development of RAPS. These plans are intended to develop systematic and comprehensive approaches to restoring the water quality of particularly polluted areas. For

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example, 41 of the 42 areas of concern in the Great Lakes Basin have seriously contaminated sediment.¹ To illustrate, the sediment in one area contains about 1.1 million pounds of polychlorinated biphenyl (PCB). PCB is a known human carcinogen and can damage the liver and reproductive and nervous systems.

A RAP is a systematic and comprehensive approach to identify specific actions necessary to control existing sources of pollution, abate environmental contamination already present, and restore beneficial uses of the waters located in a particular area of concern. It calls for all agencies, communities, and programs concerned with an area to work together on common goals and objectives to ensure the successful implementation of all pollution control efforts.

The development of RAPS requires coordination and cooperation among state and local officials, industry representatives, and local citizens. However, progress in developing RAPS has been slow, particularly in comparison with the progress made on other annexes. Some RAPS are years behind schedule. For example, the Milwaukee Harbor RAP, once planned for completion by 1987, is now scheduled to be completed in January 1991. According to LC, one reason for the delays is that all the federal, state, local, and private organizations involved have not reached agreement on their appropriate roles and responsibilities. In addition, LC determined that six of the first eight RAPS submitted for review were inadequate and needed to be revised. One problem cited by LC was inadequate information on the impacts of various pollution sources on the Great Lakes' water quality.

The delay in developing RAPS has prompted congressional concern. During the summer of 1989, congressional field hearings in Michigan and Wisconsin focused on the need for more progress and increased federal involvement in developing RAPS. In September 1989, legislation was introduced in the United States Senate (S. 1646, Great Lakes Critical Programs Act) requiring GLNPO to ensure that the Great Lakes states develop and incorporate RAPS into their water quality plans by January 1, 1993. The legislation would require that once the RAP has been included in its water quality plan, the state would become eligible for EPA funding to help implement the RAP. It was then included in another bill (S. 1178, Marine Protection Act of 1989), which was reported out of the Committee in June 1990 and was placed on the Senate legislative calendar.

¹See figure 1.1 for the location of the 42 areas of concern.

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In March 1990, similar legislation was introduced in the House of Representatives (H.R. 4323, Great Lakes Water Quality Improvement Act of 1990). In April, it was referred to the Subcommittee on Water Resources, Committee on Public Works and Transportation, which then held hearings in May.

**Disagreement Exists Over
GLNPO's Role in
Developing RAPS**

To deal with the problem, environmentalists and some state and local officials engaged in developing RAPS and environmentalists have asked GLNPO to get more involved in completing the plans. An official from one state, for example, told us that GLNPO should provide technical and organizational expertise, actively participate in citizen committees, and act as a clearinghouse for transferring pertinent information on developing RAPS from state to state. Other states expressed a desire for GLNPO to provide more funds for their work in developing RAPS.

One environmental group, in testimony at Senate field hearings, stated that while most RAPS adequately describe and define problems, they fail their ultimate purpose—to evaluate current remedial programs and propose and evaluate additional cleanup programs. The group stated that while GLNPO has provided some help in developing RAPS, it has not devoted sufficient time and resources to ensure that they are as thorough and extensive as they should be. It stated that most RAPS merely recommend more studies or additional testing and sampling, rather than delineating remedial actions. The group also stated that GLNPO has not been aggressive in insisting that citizens participate early in the development of RAPS.

GLNPO officials maintain that the Office has done what can be realistically expected, given a staff of only 33 and the limited financial resources it can devote to developing RAPS. GLNPO has given some funds to EPA regions and states for developing RAPS, prepared guidance for RAPS, and reviewed and commented on completed RAPS. It has also completed a major study on the Great Lakes that provides data that should aid in developing RAPS, working with the U.S. Fish and Wildlife Service, the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, the U.S. Army Corps of Engineers, the city of Detroit, and the state of Michigan.

GLNPO officials indicated to us that the Office has recently augmented its role in developing RAPS to some extent and is assessing whether further involvement is warranted. GLNPO's Deputy Director told us, for example, that GLNPO funded seven positions in Regions II and V in fiscal year 1989

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to help develop RAPS. The former Director said that the four additional staff hired in fiscal year 1990 will assist states in developing RAPS and LMPS. Another GLNPO official suggested that GLNPO may become more involved in developing RAPS in areas that border both the United States and Canada because the development of these RAPS requires individuals that can represent the federal government rather than an individual state. He said that GLNPO would need two additional staff for this work and additional funds for the states and EPA regions.

Still, GLNPO officials maintain that there are limits to what the Office can do to speed the development of RAPS beyond providing basic guidance and technical assistance. Developing a RAP is a major undertaking, and each requires coordination among many federal, state, and local agencies, and the incorporation of views from industry and private citizens. Moreover, GLNPO must also fulfill responsibilities for other annexes of the Agreement. While they acknowledge a role in helping to develop RAPS, GLNPO officials maintain that this task is primarily a state and local responsibility. They explain that the states are responsible for implementing pollution control programs and that RAPS often involve issues that are typically not dealt with at the federal level, such as zoning, farming practices, and other land use issues.

In addition, in February 1990 the Great Lakes National Program Manager wrote to the three EPA Great Lakes regions, stating they should assist the states in developing and implementing RAPS and asking them to determine what additional resources they would need to help state and local officials develop RAPS. Region V's Water Division requested and received two additional staff from GLNPO and another three from Region V to assist the states in developing and implementing RAPS. Region II agreed that the regions should help states develop and implement RAPS and that it would need two or three additional staff and significant funding. Region II recommended that primary funding for RAPS come from the states and that GLNPO supplement the funding as necessary.

Thus, some disagreement exists over the appropriate role of GLNPO and other organizations in developing RAPS. GLNPO believes that state and local agencies primarily should be responsible for developing and implementing RAPS and that EPA regional offices should play a larger role. It maintains that because of its small size and limited resources, its role in developing RAPS in numerous areas of concern is limited. In contrast, states and environmentalists want GLNPO to make a larger commitment because of its expertise and ecosystem perspective.

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We believe that since the development of RAPS is important to the cleanup of the Great Lakes—and since so little progress has been made in achieving this objective—this policy issue needs to be resolved. The newly formed U.S. Policy Committee, which involves representation from numerous interested parties and was established to make policy recommendations on how the United States can best address the Agreement, is uniquely situated to help resolve this policy issue. Indeed, some officials from GLNPO and other agencies told us that such a role would be particularly appropriate for this Committee, given its diverse composition and strong credibility.

Lakewide Management
Plans Not Developed

Annex 2 of the Great Lakes Water Quality Agreement also calls for the development of LMPs for each of the Great Lakes. Whereas RAPS focus on specific near-shore areas, LMPs focus on reducing or eliminating the worst pollutants in the Great Lakes' open lake waters so that beneficial uses are restored. LMPs are intended to ensure that pollutants are not increased in any areas of the lakes. Annex 2 requires comprehensive plans addressing such items as

- the threat that certain pollutants pose to human health or aquatic life,
- the estimated amount of pollutants each source contributes,
- remedial measures that are needed to restore the beneficial uses of the lakes, and
- a process for evaluating remedial implementation and effectiveness.

Although GLNPO has been involved with studies that may serve as a foundation for LMPs (particularly for Lakes Michigan and Ontario), LMPs have not yet been developed. In fact, the development of LMPs is behind the development of RAPS, with basic decisions still to be made on how the development of each plan will proceed. For example, IJC has called for a precise definition of LMPs and procedures for tracking their progress. In Senate hearings in April 1989, EPA stated that the Lake Michigan LMP would be completed by July 1990. However, in June 1990 hearings, EPA's Deputy Administrator stated that the target date for the initial draft of the Lake Michigan LMP is in the first quarter of fiscal year 1992. GLNPO officials point out that LMPs are more complex to develop than RAPS because, generally, several jurisdictions and agencies are involved.

The U.S. Policy Committee has made some progress in moving LMPs forward. For example, it submitted a policy framework for the United States and published standards for identifying substances that can

potentially affect the Great Lakes (an objective of annex 1 of the Agreement that is crucial to developing LMPs). Nevertheless, according to the Director of EPA's Environmental Research Laboratory, LMPs are not feasible now because the technology necessary to deal with difficult issues—such as how to assess the amount of pollutants being added to the open waters of the Great Lakes or how to reduce the pollutant loads to acceptable levels—has not yet been developed. The Director said that models for LMPs will be developed one at a time and each will take about 2 years to develop. He noted that this approach will permit subsequent plans to benefit from lessons learned on earlier plans. GLNPO's former Director told us that initial plans would use available information and then be modified as new information becomes available and new technology evolves.

Improvement in Gathering Information From Federal Agencies for Annual Report

The Water Quality Act of 1987 requires EPA to submit an annual report to the Congress that, in part,

- describes the achievements during the previous fiscal year in implementing the Great Lakes Water Quality Agreement,
- identifies amounts spent on initiatives to improve the Great Lakes' water quality,
- describes long-term prospects for improving the condition of the Great Lakes, and
- provides a comprehensive assessment of efforts planned to improve the condition of the Great Lakes, including the programs administered by other federal agencies.

This is the only document that reports to the Congress on the progress the United States has made in implementing the Great Lakes Water Quality Agreement. As such, it is essential for congressional oversight and for informing the public at large about how the United States is fulfilling this obligation. EPA has delegated this reporting responsibility to GLNPO.

To assist GLNPO in this effort, the act also requires each federal agency with any responsibility involving the environmental quality or natural resources of the Great Lakes to submit an annual report to GLNPO describing how its activities affect compliance with the Agreement. Specifically named in the legislation were the U.S. Army Corps of Engineers, the Soil Conservation Service, the U.S. Coast Guard, the U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration.

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The legislation required the first report, covering fiscal year 1988, to be completed by December 31, 1988. However, EPA did not issue the report until April 1990. The responsible GLNPO official explained that the information provided by the other federal agencies was late and often lacked detailed information on the progress made in implementing the Agreement. He said that the other federal agencies did not give this effort a high priority and claimed they were not sure what data GLNPO wanted.

GLNPO clarified its guidance for the report covering fiscal year 1989. For example, in early September 1989 GLNPO sent each agency a computer disk programmed and formatted to better describe the information it wanted. The form asked for information, by program or by project, on expenditures in fiscal year 1989 and expenditures planned for fiscal year 1990 in categories such as enforcement, research, remediation/mitigation, and general administration. The form also requested a list of major achievements during fiscal year 1989. GLNPO asked for a response by October 1, 1989. Although not every agency met the deadline, the GLNPO official noted that the agencies responded much faster than they had for the 1988 report.

Conclusions

GLNPO's efforts to implement the Water Quality Act of 1987 have resulted in improved coordination with federal and state agencies having a role in implementing the Great Lakes Water Quality Agreement. These efforts, including the establishment of the U.S. Policy Committee, have addressed many of the coordination problems cited in our 1982 report.

The key annex to the Agreement, however, which addresses the remediation of the most polluted areas in the Great Lakes through the development of RAPS and LMPs, has not been adequately addressed. Uncertainties about GLNPO's role in addressing this annex—particularly questions about how its mission relates to that of EPA regions, states, and local governments in coordinating and/or developing RAPS—have been a point of controversy and the development of RAPS has suffered as a result. We believe that the newly formed U.S. Policy Committee, charged with identifying situations in which the Agreement is not being fulfilled because of a lack of coordination or of sufficient priority, could play a constructive role in speeding up the development of RAPS by identifying the appropriate roles and responsibilities for GLNPO and other organizations in meeting the requirements of this important annex.

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Recommendation

To improve interagency coordination in dealing with the pollution problems of the Great Lakes, and in particular to speed progress on the development of Remedial Action Plans and Lakewide Management Plans, GAO recommends that the EPA Administrator request that the U.S. Policy Committee assess, identify, and recommend appropriate roles and responsibilities for the Great Lakes National Program Office and other organizations in developing these plans.

GLNPO in Perspective: Cleaning Up the Great Lakes Will Be Costly and Will Take Decades

The effect of years of pollution in the Great Lakes cannot be overcome without massive research, cleanup efforts, and financial investment. Improvements in GLNPO's efforts to coordinate the United States' implementation of the Great Lakes Water Quality Agreement will help, but are only a small part of the overall effort that would be needed. Even the development of RAPS and LMS—which have proven to be an extremely difficult task for public officials and other concerned parties in the region—are just initial steps to plan the cleanup. Carrying out the plans will take decades, cost billions, and require improved pollution control programs by EPA and other agencies.

Restoring the Great Lakes' Water Quality Is a Monumental Task

Concern about the potential human health effects of toxic chemicals found in the Great Lakes has increased, as growing evidence has linked these contaminants with tumors in fish, genetic defects in fish-eating birds, and reproductive disorders in lower organisms. Michigan, Indiana, Wisconsin, Illinois, and New York have all issued health advisories to people who eat fish from the Great Lakes because they are the main source of human exposure to PCBs, dichlorodiphenyltrichloroethane (DDT), mercury, and other toxic contaminants. The health advisory from New York, for example, indicated that a meal of fish from Lake Ontario could deliver a toxic dose equal to a lifetime of drinking water from that lake.

Cleaning up the Great Lakes not only will require efficient coordination but also will take substantial funding and time and considerable technical knowledge. According to a report by the Northeast-Midwest Institute (which provides information and analyses on natural resource issues and other issues affecting the Northeastern and Upper Midwestern states), the U.S. government spent approximately \$9.4 billion between 1980 and 1989 to implement the Agreement.¹ Activities funded include the construction of sewage treatment plants, the protection of groundwater and wetlands, the monitoring and analysis of water quality, the development of models for targeting control of toxic substances, the demonstration of technologies for remediating contaminated sediments, the development of standards for evaluating contaminated sediment, the evaluation of cleanup technologies, and the coordination of research.

¹Northeast-Midwest Institute et al. Funding for Federal Great Lakes Environmental Programs (Washington, D.C. May 1989)

Even efforts of this magnitude represent limited progress. As the Director of EPA's Environmental Research Laboratory noted, polluting the Great Lakes took over 100 years; consequently, their cleanup will also take many years. For some cleanup tasks, such as implementing LMPs and remediating toxic sediment, the technical solutions have yet to be developed. Furthermore, while precise estimates of the eventual total cost of cleaning up the Great Lakes are unavailable, indications are that it will cost many more billions of dollars.

Estimates for implementing RAPS illustrate the magnitude of the problem. We reported in August 1988 that it will cost at least \$1.8 billion to bring Michigan's Rouge River, one of the region's 42 areas of concern, up to the state's public health standards by the year 2005, as planned in the area's RAP.

Government Programs Adopted to Limit Toxic Discharges More Effectively

Addressing concerns about the Great Lakes' water quality involves substantially more than remediating the pollution problems already present in the lakes, such as toxic sediments. As is the case with other bodies of water, a central element of any effort to "clean up" the Great Lakes involves reducing the rate at which toxic substances enter the lakes either directly or through tributaries such as the Rouge River. However, as several recent GAO reports have demonstrated, the government's efforts to limit toxic discharges from both point sources (i.e., pollution sources for which a specific point of discharge can be identified) and nonpoint sources of pollution will need to improve substantially if the Great Lakes' water quality is to be restored.

Programs to Control Point Source Pollution Do Not Minimize Many Toxic Discharges

The National Pollutant Discharge Elimination System (NPDES) Program, established under the Clean Water Act, is the principal tool EPA and the states use to control water pollution from point sources. Under the program, facilities that discharge pollutants directly into a body of water have permits that generally specify the entities allowed to discharge pollutants, the types and amounts of pollutants that can be discharged, the conditions under which the discharge is permitted, and the location of the discharge. Even if these facilities always met permit requirements, they would still pollute the waters: NPDES permits do not prevent water pollution; they only limit it.

Effective Pretreatment of Industrial Wastes Has Been a Particularly Serious Problem

As our past work and EPA data have documented, industrial facilities that discharge pollutants directly into bodies of water, such as the Great Lakes, have sometimes violated permit limits. However, our April 1989

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evaluation of EPA's National Pretreatment Program found that industrial facilities that discharge their water indirectly into bodies of water (i.e., facilities whose pollutants go into sewer systems that feed into wastewater treatment plants) are a particularly serious problem.² Many of these industrial facilities have wastewater that contains particularly large quantities of toxic metals and organic chemicals. The treatment plants, in turn, discharge this wastewater directly into receiving waters—such as the Great Lakes.

Because the treatment plants cannot cleanse many of the toxic pollutants released into the wastestream, the National Pretreatment Program requires these industrial facilities to cleanse, or "pretreat," the wastewater before it enters the sewer system. However, our April 1989 analysis found that many industrial facilities did not comply with discharge limits under the program.³ Because of such violations, untreated toxic pollutants end up in lakes, rivers, and other bodies of water. The same report made a number of recommendations to improve enforcement against violators of these and other program requirements.

While the effectiveness of industrial pretreatment is a national concern, it is of particular importance in heavily industrial areas of the country, such as the Great Lakes states, where numerous industrial facilities discharge toxic wastes into municipal sewer systems. As documented in our 1988 Rouge River report, Detroit has a particularly large number of industries that discharge wastes into its sewer system and has had great difficulty controlling these toxic wastes through an effective pretreatment program.

**Combined Sewer Overflows
Compound the Problem**

Compounding this problem for many cities like Detroit, these ineffectively pretreated toxic wastes may feed into systems where wastewaters and stormwaters combine. Such combined sewer systems are a particular problem for several cities in the Northeast and Upper Midwest. They were intended to overflow intermittently during periods of heavy rain, when the amount of wastewater exceeds pipe capacity. In many cases, however, these systems overflow more frequently and more extensively because the sewers were not adequately enlarged to accommodate the increased wastewater that has resulted from population

²Water Pollution: Improved Monitoring and Enforcement Needed for Toxic Pollutants Entering Sewers (GAO/RCED-89-101, April 25, 1989).

³On the basis of a sample of 502 treatment plants selected randomly from the approximately 1,500 plants participating in the program, we found that about 41 percent of the plants' industrial dischargers exceeded one or more applicable discharge limits during the 12-month period examined.

growth. In addition, urban construction on previously open ground has increased unabsorbed rainwater. As a result, frequent overflows may send heavily polluted water directly into bodies of water.

Combined sewer overflows are a particularly serious problem along the Rouge River. According to a 1987 Southeast Michigan Council of Governments study, virtually all of the following toxic substances—arsenic, chromium, mercury, and PCBs—and 71 percent of the nickel and 67 percent of the cadmium entering the Rouge River originate from combined sewer overflows. While state regulators and local officials are planning strategies to deal with this problem, effective solutions are many years away.

Pollution From Nonpoint Sources Is Largely Uncontrolled

Although there are gaps in the regulation of point sources of water pollution, no controls exist at all for many toxic "nonpoint" sources of pollution. Point sources, such as manufacturing plants, are visible, discrete, and easily identifiable. However, pollution from nonpoint sources (such as runoff of pesticides and fertilizer from farms or runoff from streets in urban areas) is diffuse and often hard to trace to its place of origin. Such pollution sources cannot be regulated through permits limiting end-of-the-pipe discharges. Rather, they result from past and present land use habits that reflect the way farming, mining, timber harvesting, and other economic activities are conducted.

To cope with the pollution of the Great Lakes from nonpoint sources, GLNPO has worked with EPA offices and several other agencies to support surveys to better understand the problem. For example, it funded a project by the Ohio State University Extension Service to survey landowners' and operators' pesticide use in Ohio's Lake Erie drainage basin. GLNPO has also funded projects demonstrating environmentally sound land use practices and other institutional arrangements to prevent the problem.

While these projects are sound beginnings, considerably more effort will be needed to resolve the problem of the Great Lakes' nonpoint sources. For example, agricultural contamination, the single largest source of nonpoint source pollution nationwide and a major contributor of the pollution in the Great Lakes, is promoted by farming methods that rely heavily on the use of pesticides and other chemicals. Such practices have been reinforced for many years by federal agricultural programs that have traditionally emphasized production while paying little heed to water quality goals. While the Department of Agriculture has recently

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taken steps to better integrate concerns about water quality into its programs, the fundamental reorientation of existing farm programs and practices that will be needed to deal effectively with the problem will require a strong political commitment and many years of effort.⁴

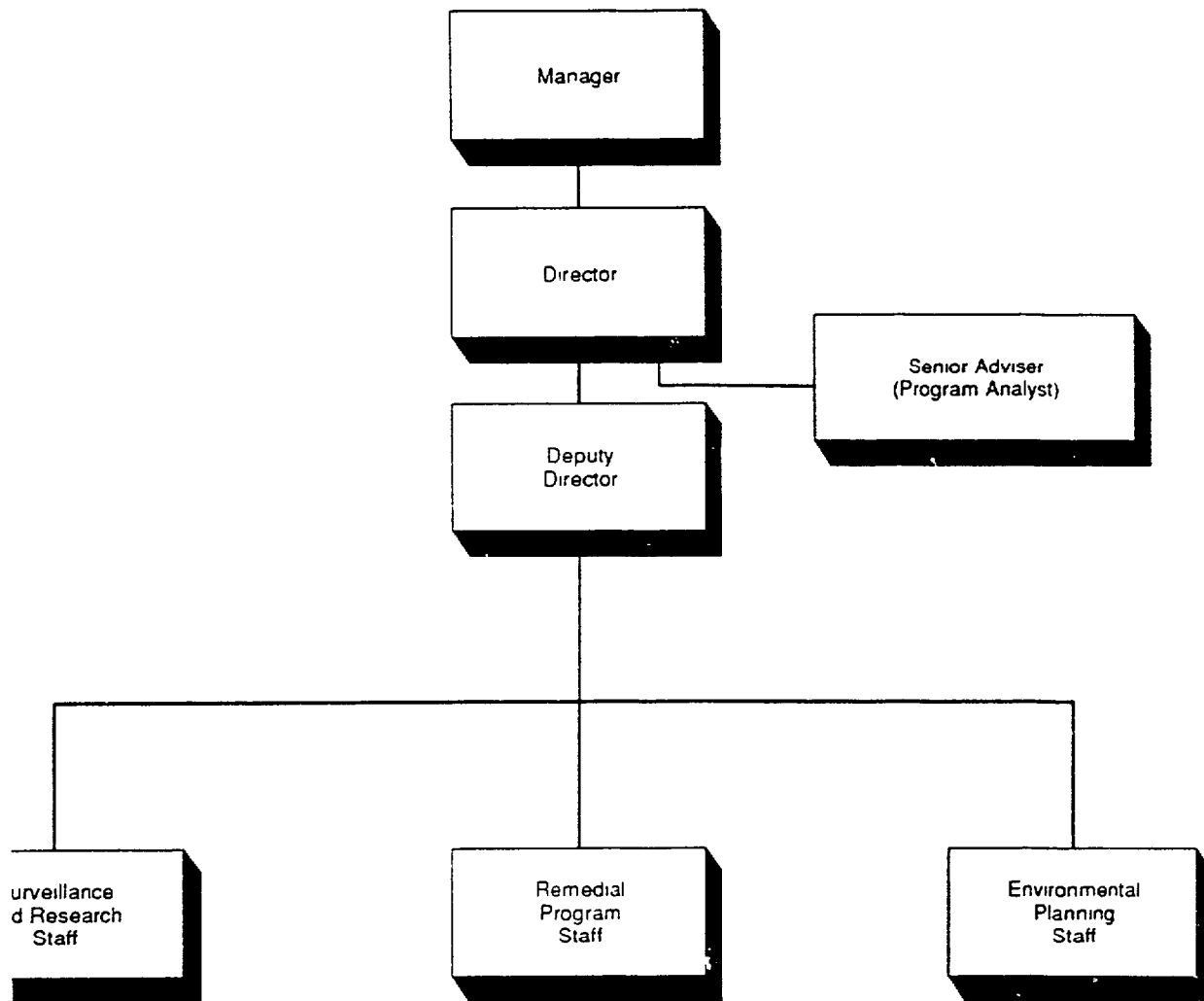
Conclusions

Under the best of circumstances, cleaning up the Great Lakes will still be extremely costly and will take well into the next century. GLNPO can play an important role toward this end by helping to coordinate the efforts of organizations at all levels of government and by providing direct technical support in certain instances. However, GLNPO's potential contribution should be evaluated in the context of the enormous task at hand. Realistically, success in cleaning up the Great Lakes will depend much more heavily on the level of commitment and resources the nation and the Great Lakes region are willing to devote to the effort, the prospects for resolving formidable technical challenges currently impeding the cleanup of the Great Lakes, and the ability of federal and state regulators to improve programs to limit the release of toxic discharges into the lakes.

⁴GAO plans to address this issue in another report. The report will also focus on EPA and state efforts to control other nonpoint sources of water pollution. Among the other nonpoint pollution sources that will be addressed are mining, timber harvesting, and urban runoff.

NPO Organizational Chart

akes National Program Office Organizational Chart



Federal Agencies With Key Roles in the Cleanup of the Great Lakes

National Atmospheric and Oceanic Administration

The National Atmospheric and Oceanic Administration (NOAA) conducts environmental research, manages resources, and provides environmental services in coastal and estuarine waters, including the Great Lakes. Much of NOAA's work pertaining to the Great Lakes is done by the Great Lakes Environmental Research Laboratory. NOAA runs the Sea Grant Program, and NOAA's National Weather Service monitors the weather and climate.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers maintains navigation channels in the Great Lakes and their tributaries. The Corps dredges, disposes of dredged material, and manages water levels. It plays an important role in managing contaminated sediment in the Great Lakes.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service focuses on habitat and contamination issues relevant to the protection and enhancement of wetlands, fresh water fisheries, and wildlife populations. It collects data for national inventories of wetlands and waterfowl populations. It also operates the National Fisheries Research Center-Great Lakes, which assesses, protects, and rehabilitates fish resources and habitats in the Great Lakes.

U.S. Department of Agriculture

Three offices in the U.S. Department of Agriculture are involved with the Great Lakes. The Soil Conservation Service works with states and farmers to prevent erosion and improve water quality. The Cooperative Extension Service and the Agricultural Stabilization and Conservation Service deliver financial, technical, and information services to farmers.

U.S. Coast Guard

The U.S. Coast Guard helps clean up spills of pollutants, encourages measures to prevent such spills, controls shipping, enforces the prohibition of waste discharges from ships into the Great Lakes, and enforces laws regarding the handling and transfer of hazardous substances and oil on the lakes.

U.S. Geological Survey

The U.S. Geological Survey conducts several activities concerning the Great Lakes and their tributaries. For example, it analyzes water flow, monitors water quality, and studies surface water and groundwater. It also provides technical leadership on major issues, such as the effects of contaminated groundwater on the quality of the Great Lakes' surface water.

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