S. Hrg. 108–201

GREAT LAKES RESTORATION MANAGEMENT: NO DIRECTION, UNKNOWN PROGRESS

HEARING

BEFORE THE

OVERSIGHT OF GOVERNMENT MANAGEMENT, THE FEDERAL WORKFORCE AND THE DISTRICT OF COLUMBIA SUBCOMMITTEE

OF THE

COMMITTEE ON GOVERNMENTAL AFFAIRS UNITED STATES SENATE

ONE HUNDRED EIGHTH CONGRESS

FIRST SESSION

JULY 16, 2003

Printed for the use of the Committee on Governmental Affairs

U.S. GOVERNMENT PRINTING OFFICE

88–934 PDF WASHINGTON : 2003

For sale by the Superintendent of Documents, U.S. Government Printing Office
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GREAT LAKES RESTORATION MANAGEMENT: NO DIRECTION, UNKNOWN PROGRESS

WEDNESDAY, JULY 16, 2003

U.S. SENATE,
OVERSIGHT OF GOVERNMENT MANAGEMENT, THE FEDERAL WORKFORCE, AND THE DISTRICT OF COLUMBIA SUBCOMMITTEE,
OF THE COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 10:00 a.m., in room SD–342, Dirksen Senate Office Building, Hon. George V. Voinovich, Chairman of the Subcommittee, presiding.

Present: Senators Voinovich, Durbin, and Coleman.

OPENING STATEMENT OF SENATOR VOINOVICH

Senator VOINOVICH. The hearing will come to order. Good morning and thank you for coming. We are here today to discuss what I believe is one of the most pressing environmental issues facing our Nation—restoration of the Great Lakes.

This hearing is entitled, "Great Lakes Restoration Management: No Direction, Unknown Progress." Specifically, the hearing will focus on a recent report by the General Accounting Office concerning the Federal and State environmental programs operating in the Great Lakes basin and the funding devoted to them. This GAO report evaluates the restoration strategies used and how they are coordinated and assesses the overall environmental progress made in the basin restoration effort.

Thirty-seven years ago, when I saw firsthand the effects of pollution on Lake Erie and the surrounding region, I knew that we needed to do something to protect our environment and the Great Lakes. At the time, Lake Erie was suffering from eutrophication and was known worldwide as a dying lake. It was the poster child for a dying lake. The decline was heavily covered by the media and became an international symbol. I remember British Broadcasting coming to Ohio and doing a documentary on it.

I made a commitment then, as a State legislator, to do everything possible to stop the deterioration of Lake Erie and wage what I refer to as the "Second Battle of Lake Erie," to reclaim and restore Ohio's Great Lake.

I have continued this fight throughout my career, as county commissioner, State legislator, Lieutenant Governor, Mayor of Cleveland, Governor of Ohio, and now U.S. Senator. I consider my efforts to preserve and protect Lake Erie and all of the Great Lakes to be among the most significant of my career, and for that matter, of my life.

Lake Erie's ecology has come a long way since the mid-1960's. Today, people can enjoy Lake Erie. It is a habitat to countless species of wildlife, a vital resource for the area's tourism, transportation, recreation industries, and the main source of drinking water for many Ohioans. Lake Erie is currently Ohio's greatest natural resource. Together, the Great Lakes make up the largest body of fresh water in the world, providing 40 million people in the United States and Canada with drinking water.

Although we have made progress in our restoration efforts, there is much more that needs to be done to improve and protect the Great Lakes. I emphasize that this is an urgent need that deserves and demands a well-coordinated effort, one that cannot be met by simply adding individual programs to those that already exist.

The GAO made it clear in its report—released earlier this year, entitled "An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals"—that the number of programs is not the problem. Rather, the report states that while there are many Federal, State, and local programs, restoration of the Great Lakes is being hindered because there is little coordination and no unified strategy for those activities.

Furthermore, the GAO found that although more than $1 billion has been spent on restoration efforts on the Great Lakes since 1992, it is not possible to assess comprehensive restoration progress because overall indicators for the Great Lakes do not exist.

I do not know which is worse, the fact that GAO came to these conclusions or that I have not found anyone that is surprised by them.

The GAO recommended that the Environmental Protection Agency oversee these efforts to ensure that the programs are coordinated, that there is a comprehensive Great Lakes strategy, and that environmental indicators are developed to measure restoration progress.

This week, I joined Senators DeWine and Levin in cosponsoring the Great Lakes Environmental Restoration, Protection, and Recovery Act, which is S. 1398. This bill responds to the GAO report and to my long-held concerns about Great Lakes restoration. In short, this bill moves us closer to our goal of restoring the Great Lakes by providing funding and promoting coordination. Expanding on the Lake Erie Water Quality Index that I released in 1998 as Governor of Ohio, the bill directs the EPA to create a series of indicators of water quality and other factors for all of the Great Lakes.

Restoring the Great Lakes could be the greatest legacy any of us will leave on this earth. We must work hard to ensure that the progress we have made continues.

As many of you know, I was intimately involved in the creation of the Comprehensive Everglades Restoration Plan. As Chairman of the Transportation and Infrastructure Subcommittee, of the Committee on Environment and Public Works, I was proud to be a sponsor of the Water Resource Development Act of 2000, which approved this ambitious plan. Earlier this year, I spoke at the 11th Annual Everglades Coalition Conference in Florida. I told them—let me quote from my statement—"What I would love to do as Sen-

ator is to be able to put the same kind of coalition together that you have been able to do for the Everglades for the Great Lakes." This is my dream, to put together a comprehensive restoration plan for the Great Lakes.

Right now, we have the mayors getting together. That is wonderful. The governors are developing priorities and objectives, a coalition of groups—the Great Lakes United—have put together a restoration agenda. And we here in Congress have put forth proposals earlier this week.

However, the fact of the matter is that if we are going to get something done, we need to create a symbiotic relationship with all of the public and private players in the United States and Canada in order to develop a comprehensive restoration plan for the Great Lakes. I am most interested in hearing from the witnesses today on how we can get this done.

I also look forward to hearing from all of our witnesses about this GAO report, and to hearing their recommendations for the current restoration programs in the Great Lakes, as well as possible next steps to address this problem. I want to hear your views on our new legislation, S. 1398. We have an impressive lineup of witnesses this morning and I look forward to a very informative discussion.

I am pleased today to welcome two of my friends and colleagues, Senator Mike DeWine, the senior Senator from Ohio, and Senator Carl Levin of Michigan, who will testify first this morning. I commend them on their excellent leadership as co-chairmen of the Great Lakes Task Force. I look forward to their valuable input on this subject, especially since they requested the GAO report we are discussing today, and I thank you both for doing that because that puts us in a framework where we can move.

On our second panel, we will hear from people who conducted the study at GAO and from several Federal agencies that are involved programmatically with the Great Lakes, including the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, and the National Oceanic and Atmospheric Administration.

Tom Skinner is here, EPA's Region V Administrator, who I had a chance to meet with yesterday, and I look forward to his testimony on the role of the Great Lakes National Program Office in managing the various environmental programs.

And the third and final panel includes the Chairman of the United States Section of the International Joint Commission, Dennis Schornack, whom I have known for many years. He worked for Governor Engler in Michigan. I also welcome his counterpart, the Chairman of the Canadian Section, Herb Gray. Herb, I am very happy that you are here today. I know that Mr. Gray is aware that the subject of restoration of the Great Lakes has been a burning issue for the U.S. and Canadian Inter-parliamentary Group that I have had the pleasure of participating in over the past years, along with Senator DeWine.

Also on the third panel is Illinois State Senator Susan Garrett, and Chris Jones, Director of the Ohio Environmental Protection Agency, who will testify on behalf of the Council of Great Lakes Governors.

And finally, Margaret Wooster from Great Lakes United will testify. Great Lakes United is a U.S. and Canadian coalition dedicated to preserving and restoring the Great Lakes. Last August, I held an Environment and Public Works Committee field hearing in Cleveland, Ohio, that examined the increasingly extensive oxygen depletion, or hypoxia, in the central basin of Lake Erie. Great Lakes United testified at that hearing and was extremely helpful in shedding some light on the problem and in offering possible solutions.

Yesterday, I had the opportunity to meet with Ms. Wooster about a recent report that Great Lakes United released on how to clean up the Great Lakes. I look forward to hearing more about those recommendations for restoration in her testimony today.

I now yield to the Ranking Member of the Subcommittee, my good friend, Senator Durbin from Illinois. Senator, a lot of the activity by the governors is centered in Illinois through the leadership of Governor Daley and I would appreciate hearing from you today.

I am going to remind any of the other Senators that show up today that I am going to request that they submit their statements in writing so that we can get it in the record and get on with the witnesses.

Senator Durbin.

OPENING STATEMENT OF SENATOR DURBIN

Senator DURBIN. Thanks, Mr. Chairman. Thanks for your leadership on this hearing and I would like to have my entire statement be made part of the record. At this point, I would like to summarize it very quickly.

I would like to salute my colleagues, Senators Carl Levin and Mike DeWine. I think what we have demonstrated here is a bipartisan effort to deal with a national treasure, our Great Lakes.

My statement outlines the history of the development of the City of Chicago and the expansion of the Nation's economy through Lake Michigan. Several things I would like to note publicly. Congress recognized the importance of Chicago's harbor, appropriating $247,000 for its development by the end of 1844. By the late 1800's, the people of Illinois saw the great economic potential of Lake Michigan, but also saw problems. Sewage flowing through the Chicago River into Lake Michigan caused serious public health concerns.

In 1887, Chicagoans decided to embark on their first Great Lakes restoration effort. They boldly dared to reverse the flow of the Chicago River to stop the sewage in that body of water from flowing into Lake Michigan, their drinking water source. I have a place in Chicago overlooking Lake Michigan. I can still look out every morning and see the water intakes that were built in that era so that they could go further offshore to draw the water, which might be a little cleaner and purer, for the people to drink. The Metropolitan Sanitary District of Greater Chicago successfully reversed the flow of the Chicago River by 1900 and alleviated chronic pollution problems.

A hundred years later, Lake Michigan, as many of the Great Lakes, remains a vital economic engine for my State and sur-

rounding States, but it has terrific environmental challenges. It is the largest body of fresh water entirely within the boundaries of the United States. This Great Lake extends along 63 miles of shoreline in Illinois, provides drinking water for six million people in Illinois. The lake also continues to serve as a great avenue for commerce, and despite all of this, Lake Michigan is in trouble.

Illinois has Lake Michigan fish consumption advisories due to unhealthy levels of mercury, chlordane, and PCBs. The Lake Michigan area at Waukegan is contaminated due to industrial activity throughout the last century. There are several Superfund sites in the area, some of which have been cleaned up to a large extent, but a great deal of the work still remains to be done. And, of course, there is a great concern about the invasive fish species, such as the Asian carp.

We need to be bold in addressing this, and I salute my colleagues for their leadership in this legislation responding to the GAO report which they requested. Those who reversed the flow of the Chicago River knew that bold steps were necessary to reverse the trend of environmental degradation of our precious Great Lakes. Thanks to similar efforts, our ecosystems in our country have begun to be restored, including the Chesapeake Bay and the Florida Everglades. It is interesting to me that the challenge has been made that we who live near the Great Lakes have to show the same concern as our colleagues have shown when it comes to the Florida Everglades and Chesapeake Bay. I accept that challenge, and I think this legislation responds to it.

Yet, despite all of our good intentions and all of our ambitions, the GAO makes it clear we don't have our act together. State and Federal agencies and local agencies of government just are not on the same page, talking about the future of the Great Lakes. I think this legislation will help change this. This legislation enhances the coordinating functions of the EPA. Tom Skinner is here, my friend from Region V in the State of Illinois. He understands that. State Senator Susan Garrett is here, who represents a district right on Lake Michigan, and she understands that, as well, and I am glad that she is going to be adding testimony.

This is a great starting point. I look forward to hearing further thoughts from our panelists. Thank you, Mr. Chairman.

[The prepared opening statement of Senator Durbin follows:]

OPENING PREPARED STATEMENT OF SENATOR DURBIN

I want to thank my colleague and fellow Great Lakes Senator, George Voinovich, for calling this important hearing today and I also would like to welcome two of my colleagues and constituents, Susan Garrett and Tom Skinner.I74Lake Michigan's Role in Illinois History

The history of Chicago, the largest American city that borders the Great Lakes, is directly linked to Lake Michigan.

The Miami Indians of the Illiniwek Tribe, settled in a village they called "Checau-gou" on the southern extremity of Lake Michigan in the 1640's.

By 1682, French explorer La Salle claimed the Mississippi River Valley for France and called the portage he crossed from St. Joseph River in Michigan to the Illinois River the "Chicago Portage," after the Miami Indians' name for the region.

Chicago Portage became an important point linking Lake Michigan to several rivers in the region.

In 1795, the U.S. gained control of a tract of land at the mouth of the Chicago River, which became the site for Fort Dearborn.

Chicago, in turn, rapidly became the leading port in the West.

Between 1833 and 1839 the annual average import trade for Chicago was $1.5 million and the export trade was $350,000.

Clearly, Lake Michigan was one of the chief economic engines behind the development of Chicago and the rest of Illinois.

Congress, recognizing the importance of Chicago's harbor, appropriated $247,000 for its development by the end of 1844.

By the late 1800's, the people of Illinois experienced the effects of environmental degradation of Lake Michigan: Sewage that flowed through the Chicago river into Lake Michigan caused plagues of typhoid fever, cholera and dysentery.

In 1887, Chicagoans decided to embark on their first Great Lakes restoration effort: They boldly dared to reverse the flow of the Chicago River, to stop the sewage in that body of water from flowing into Lake Michigan, their drinking water source.

The Metropolitan Sanitary District of Greater Chicago successfully reversed the flow of the Chicago River by 1900, thereby alleviating the chronic pollution problems.

LAKE MICHIGAN TODAY

One hundred years later, Lake Michigan remains a vital economic engine for Illinois and other surrounding states, but it also continues to experience environmental challenges.

Lake Michigan is the largest body of fresh water entirely within the boundaries of the United States.

The Great Lake extends along 63 miles of shoreline in Illinois.

It provides drinking water for six million people in Illinois.

The lake also continues to serve as an avenue for commerce.

Despite all of the positive aspects, Lake Michigan is troubled.

Illinois has Lake Michigan fish consumption advisories due to unhealthy levels of mercury, chlordane and PCBs.

The Lake Michigan shore at Wauykegan, IL is contaminated, due to industrial activity there throughout the last century.

There are several Superfund sites in this area, some of which have been cleaned up to a large extent, but the work has yet to be completed, primarily due to a lack of funding.

The latest threat to Lake Michigan are two types of Asian carp, bighead and silver, which we are trying to stop from reaching Lake Michigan. These carp can grow to more than 100 pounds and 40 inches long and could cause untold damage to the Great Lakes due to their voracious appetites.

WHAT NEXT

We need to be bold, like those who reversed the flow of the Chicago River, and reverse the trend of environmental degradation of our precious Great Lakes.

Thanks to coordinated efforts and significant funding, other ecosystems in our country have begun to be restored, including the Chesapeake Bay and the Florida Everglades ($7 billion authorized so far, could be up to $14 billion total).

Yet, despite all of the well-intentioned organizations and programs in the Great Lakes, there is still a lack of coordination and funding.

That is why I am proud to be cosponsoring legislation with Senators DeWine, Levin and Voinovich, to create a $6 billion investment in the Great Lakes over 10 years.

This legislation would enhance the coordinating functions of EPA, establish an Advisory Board with a variety of stakeholders, including representatives of the Cities Initiative started by Mayor Daley of Chicago, and create ways to measure progress.

I believe this is a good starting point, and I look forward to hearing further thoughts from our panelists.

Senator VOINOVICH. Thank you, Senator Durbin, for your statement.

If there are no objections, all other Senators' statements will be submitted for the record and we will proceed to take the testimony of Senator DeWine and Senator Levin.

I would like to also welcome Senator Coleman from Minnesota here this morning. Norm, thanks very much for being here.

Senator COLEMAN. Thank you, Mr. Chairman.

Senator VOINOVICH. Senator DeWine.

STATEMENT OF HON. MIKE DeWINE,[1] A U.S. SENATOR FROM THE STATE OF OHIO

Senator DEWINE. Mr. Chairman, thank you very much. I want to congratulate you and thank you, as well as Senator Durbin and Senator Coleman, for your great commitment to the Great Lakes. I know all three of you have a longstanding commitment, not only from a personal point of view, but in a public policy point of view, to the Great Lakes.

Mr. Chairman, I know of your great love and great commitment to the Great Lakes. You fish in the Great Lakes often. You tell me about your fishing prowess in the Great Lakes—— [Laughter.]

And give me the fishing report quite often. I am jealous when I hear about it. I also know that you live within walking distance of Lake Erie and you understand about the Great Lakes. As mayor and as governor, you had a great commitment to the Great Lakes. You did a great deal. You continue to work very hard for the Great Lakes. The fact that you are holding this hearing today shows your continued commitment and I look forward to working with you and the other Members of this Subcommittee to enhance the Great Lakes.

I am delighted to be here with my colleague from Michigan. I think it says a great deal. Senator Levin and I, as co-chairs of the Great Lakes Task Force, a Republican from the State of Ohio and a Democrat from the State of Michigan, are cosponsoring S. 1398. It is something when two people, one from Ohio, one from Michigan, can get together on anything. But we are together. We have worked together on many things. But we put this bill together, we worked very hard together, and we are glad to have the members of this panel as cosponsors of this bill.

It is about time, frankly. We all have talked about the Great Lakes. We have talked about the need for an overriding vision for the Great Lakes. We prepared for this bill and now it is time to introduce it and now it is time to move forward.

What we are saying with this particular bill is that there needs to be a national policy for the Great Lakes. We need to have a national vision for the Great Lakes. And finally, we need to have a national commitment to the Great Lakes.

We have all worked, all of us in this room have worked on a kind of a piecemeal basis in the past to help the Great Lakes, and each one of us in this room can point to different things that we have done for the Great Lakes. But what we need now to do is to wrap that all together and to look forward, not just a year or 2 years or 5 years, but say, what do we want to accomplish for the next 10 years and what is going to be the commitment of this country, because this is truly, as Senator Durbin has said and as you have said, Mr. Chairman, a national treasure. It is a national treasure that we have to preserve, we have to enhance so that we can hand down to our children and our grandchildren and our great-grandchildren, and that is our moral obligation. We have an obligation to do that, and that is what we are saying with this bill.

We have, frankly, waited long enough to turn the talk into action, because the sad fact is that for all the good work we have

[1] The prepared statement of Senator DeWine appears in the Appendix on page 43.

done in the past, and there has been great work done by so many people, and we have made progress, but the sad fact is, we are not keeping up. We are not keeping up with the sewers. We are not stopping the sewers from overflowing into the Great Lakes. They do it every day. We aren't controlling and preventing the spread and introduction of the invasive species into the Great Lakes.

We are still seeing, Mr. Chairman, our wetlands vanish, and they are vanishing in Ohio and the other States. And not only do we need to stop them from vanishing, frankly, we need to begin to restore them and to do a better job in that respect. We need to move forward and not only be on the defense, but start to be on the offense.

We also must ensure, Mr. Chairman, that the public has adequate access to the Great Lakes. That is a particular problem in our home State of Ohio, where a great deal of the Great Lakes lakefront, Lake Erie lakefront, is in private hands, and we need to make sure that when there is available land, when it does come up, when there is a willing seller, that there is money available to make more frontage available for the public so that the public can, in fact, enjoy it.

We also need to be concerned about fish and wildlife habitat and make sure that it is maintained and improved.

I have been asked, as I am sure Senator Levin has been and my other colleagues who have cosponsored this bill, about the $6 billion. Some people have said it is too much. Some people said it is not enough. The truth is, there is nothing magical about $6 billion. That is spread over 10 years. The truth is, it is a minimum amount of money. We all know that.

And while there is nothing magical about the $6 billion, there is certainly something magical about the Great Lakes, and we all know that. There is something magical about looking out at any one of our Great Lakes and seeing a man out there all by himself in a boat fishing. There is something magical about seeing a young couple or an old couple walking along the shore at night. There is something magical about seeing a little child out there being taught by his grandfather how to fish, or his grandmother how to fish. There is something magical about seeing a great cargo freighter plying the waters of the Great Lakes, a freighter that, I might add, is by far the safest form or way to move our cargo in this country and something that needs to be enhanced and treasured, something we need to try to make sure is always available.

These are things that you cannot measure by money, but it is something that money can make sure is available and continues. So this is a great treasure. It is a treasure that is hard to compare, but I think as Senator Durbin and you, Mr. Chairman, and Senator Coleman have all so eloquently said, and my colleague, Senator Levin, has said in the past, something that we have a moral obligation to do what we can to preserve. And so this is what this bill does.

I thank you very much for holding this hearing, not just about this bill, but for holding this hearing about the GAO study. As you have said, the GAO study showed us what we are doing wrong and I think it has pointed the way and it is sort of like an alarm that has gone off in the night and said, look, we have got problems and

we have not done things the right way. But it has also pointed and kind of shown us the light and said, these are the things that we need to change. These are things that we can do in the future and now is the time to do it.

So I thank you, Mr. Chairman, and I would like to submit my full statement for the record. I appreciate very much the fact that you have held this hearing today.

Senator VOINOVICH. Thank you, Senator DeWine, and you can be assured that we will insert your statement in the record.

Senator Levin.

STATEMENT OF HON. CARL LEVIN,[1] A U.S. SENATOR FROM THE STATE OF MICHIGAN

Senator LEVIN. Mr. Chairman, let me thank you, Senator Durbin, Senator Coleman, and other Members of this Subcommittee for your strong support of the Great Lakes, for your leadership, and for your calling this hearing today on the GAO report and on the bill which I am proud to have cosponsored with Senator DeWine and which you and other Members of this Subcommittee and, indeed, the Senate have cosponsored.

We are temporary stewards of a unique national treasure. I know the Great Lakes are the only bodies of fresh water on earth which can be seen from the moon. The Great Lakes are actually visible if you stood on the moon. I don't know if there are too many other natural features about which that is true.

If you spread the waters of the Great Lakes on the entire 48 contiguous States, it would be about ten feet deep. We have the world's greatest treasure of fresh water and I think we all feel keenly about protecting that. I know everyone in this room and you, Mr. Chairman, Senator Coleman, and Senator Durbin, those of us who live on the Great Lakes, feel very keenly about this responsibility.

If I could just hearken back for perhaps 25 or 30 years, the first time I testified before the Senate was to urge the Senate to adopt a national standard on the level of phosphates in detergents because of the damage that those phosphates were doing, particularly to Lake Erie. And you, Mr. Chairman, and I and Senator DeWine, of course, have a particular local interest.

But we saw the damage that Lake Erie was undergoing because of the extra phosphate in detergents and we adopted a little ordinance in my hometown of Detroit when I was President of the City Council to reduce the level of phosphates which would be allowable in detergents sold in our city. People kind of scoffed at that and said, what can you do with a local ordinance? The answer was, perhaps not a lot, but perhaps that will lead to State action and then to Federal action. In fact, that is what happened. It is kind of proof of the old saying, "think globally, act locally." It is kind of a good example of what can happen, and there have been a lot of examples.

You, Mr. Chairman, both as governor and as mayor, have been involved deeply with Great Lakes restoration. And I know Senator Coleman, Senator Durbin, and others, and I know Senator DeWine

[1] The prepared statement of Senator Levin appears in the Appendix on page 47.

personally have been involved in a lot of small steps that we have taken, but they are still small steps. We have not taken that major stride that we need to take in terms of protecting and preserving the Great Lakes.

Some of those small steps have been trying to control the sea lamprey. We have been able to reduce that population by 90 percent. We have taken a very aggressive step there which has worked because we worked together. The lake sturgeon recovery program is also apparently working.

We have destroyed a significant percentage now of high-level PCB wastes, up from approximately 40 percent just 5 years ago to over 80 percent in April 2002. We finally have one of the Areas of Concern, where there are contaminated sediments, which has been upgraded now to a recovery area, though not yet off the list. We don't have any of our Areas of Concern where we have contaminated sediments which have been removed from the list, but we finally have upgraded one in Pennsylvania to a recovery area.

So we know that there are actions which can be taken at the Federal, State, local level with the help of all the groups who are involved that will make a difference, but we need to take, as Senator DeWine has said, the big step, the giant step, the comprehensive step in terms of resources, in terms of vision, in terms of two areas of coordination which are essential. One is at the Federal level and the other one is between the Federal Government and State, local level, and all of the groups which are involved in this effort.

So the bill which we have introduced does do both of those coordinating efforts. It takes those steps with an advisory board which connects everybody together, as well as a Great Lakes Coordinating Council, to ensure that Federal activities are coordinated.

I won't go through all the other provisions of this bill other than to say that Senator DeWine and his leadership have been absolutely instrumental in getting this bill to where it is now and that your leadership, Mr. Chairman, and that of Senator Durbin, Senator Coleman, and others will hopefully be able to push this across the finish line in the Senate.

But again, it has been eloquently stated by Senator DeWine and you, Mr. Chairman, and others as to what our responsibility is as temporary stewards of the Great Lakes. We, all of us who are Great Lakes Senators, feel keenly that this is a national issue. Indeed, this is an international issue.

One-tenth of our people in America rely on the Great Lakes—jobwise, sports-wise, water-wise for drinking, and in a lot of other ways. One-tenth of Americans are dependent directly on the Great Lakes and this is something which we are, very keenly sensitive to. Hopefully, we can now take this additional, this major step in terms of protecting a treasure which we know is unique to the world. Thank you very much.

Senator VOINOVICH. Thank you, Senator Levin.

I would just like to thank both of you for your eloquence this morning and for your leadership of the Great Lakes Commission. Senator DeWine, you caught me up with the magic of some of the things that you were describing. They are things that I relate to

very clearly. It is little known that I can look out of my living room window and see Lake Erie. I always tell friends that I am very fortunate that those nights that I am home, that I can take 100 steps and see a beautiful portrait by the master, and it is different each night.

I am so pleased that you have made this commitment, that you have this commitment. It is a real issue, and I think if we really put our minds to this, we can put this plan in place and really see something happen.

I have to tell you, over the years, I kept saying, we have got all these groups doing all these things. And, of course, when you are—I was Chairman of the Council of Great Lakes Governors. You are just doing the governors thing. And then I was a mayor. We have a chance as Federal officials to try and bring all of this together, and again, I applaud your leadership and look forward to working with you.

Senator LEVIN. Thank you.

Senator DEWINE. Thank you, Mr. Chairman.

Senator VOINOVICH. Thank you.

As our witnesses come forward, I would like to say that due to time restraints this morning—I think we have got a vote at 12:05—we are going to strictly enforce the 5-minute time limit on opening statements. I request that you monitor the timer in front of you and if you can make your statement in less than 5 minutes, we would appreciate that. I want all of you to know that your statements will be entered into the record in their entirety.

Additionally, I am going to try to limit the period for questions to 5 minutes and only one round per panel. I would like you to know that we intend to submit questions to you in writing and would hope that you could get back to us with the answers to those questions as quickly as you possibly can.

We will now proceed to the second panel. Since it is the custom of this Subcommittee to swear in the witnesses, I will ask all of you to rise so that I can swear you in.

Do you swear the testimony you are about to give before this Subcommittee is the truth, the whole truth, and nothing but the truth?

Mr. STEPHENSON. I do.

Ms. THORSON. I do.

Mr. SKINNER. I do.

Col. RYAN. I do.

Mr. KEENEY. I do.

Senator VOINOVICH. Let the record show that all of the witnesses answered in the affirmative.

Our first witness is going to be John Stephenson, Director of Natural Resources and Environmental Issues, U.S. General Accounting Office. Mr. Stephenson, we are very glad to welcome you here today. Please proceed.

TESTIMONY OF JOHN B. STEPHENSON,[1] DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, U.S. GENERAL ACCOUNTING OFFICE

Mr. STEPHENSON. Thank you, Mr. Chairman, and Senator Coleman. I am here today to discuss our work on environment restoration activities at the Great Lakes.

As you know, the Great Lakes is the largest system of fresh water in the world. It provides drinking water to over 26 million U.S. citizens. It is an inland waterway for the inexpensive transport of goods. It is the water for the region's industry and a recreation resource for boating, swimming, and sport fishing.

My testimony is based on our April 2003 report which we did for Congress' Great Lakes Task Force in which we attempted to identify total Federal and State funding for Great Lakes restoration programs. We looked at overall planning and coordination of restoration efforts and tried to assess restoration progress since the original Great Lakes Water Quality Agreement was signed by the U.S. and Canada in 1972.

It is fair to say that progress has been made in several areas, such as controlling the harmful sea lamprey, reducing the water's phosphorous content, and improving some fish populations. But the Lakes are still threatened and actually getting worse on many environmental fronts.

It has been over three decades since the original agreement was signed, yet raw sewage is still being dumped into the Lakes. Fish are still contaminated with pollutants such as mercury and PCB, making them unsafe to eat, and beach closings have increased drastically in recent years to over 900 on Lake Michigan alone in 2002.

As we reported last year, a 1987 amendment to the agreement, among other things, targeted 41 specific Areas of Concern for clean-up, 26 in U.S. waters, 12 in Canadian waters, and five shared by both. However, none of the U.S. areas have been restored to beneficial use and only two Canadian areas have been restored.

So what is the problem? Is it lack of resources? Is it lack of a strategic plan? Is it the lack of an organizational entity with the authority to set priorities and evaluate alternatives? Is it the lack of indicators in a monitoring system to assess restoration progress? Actually, the answer to all of these questions is yes.

We identified 181 Federal and 68 State programs spanning ten agencies and all eight Great Lakes States operating in the basin. While Great Lakes specific funding for some of the Nationwide and Statewide programs is often not tracked and, therefore, difficult to determine, we identified at least $3.6 billion, $2.2 Federal and $1.4 State, going towards Great Lakes restoration over a 10-year period ending in fiscal year 2001.

In contrast, about $5.3 billion, or $1.7 billion more, was devoted to South Florida ecosystem restoration during roughly the same 10-year time period. So while there are numerous programs and con-

[1] The prepared statement of Mr. Stephenson with an attachment appears in the Appendix on page 50.

siderable resources being devoted to the basin, one has to question what we are getting for the effort.

One problem is that there are a variety of strategies at the binational, Federal, and State levels to address specific environmental problems, but there is no overarching plan for coordinating these disparate strategies and program activities into a single coherent approach for restoring the basin. Without such a plan, it is difficult to ensure that limited funds are used effectively. Other large-scale ecosystem restoration efforts such as South Florida and the Chesapeake Bay have clearly demonstrated the benefits of such a plan.

Exacerbating the problem is the lack of an effective, authoritative organizational entity for planning, monitoring, and establishing funding priorities. The Clean Water Act of 1987, we think, granted EPA's Great Lakes National Program Office with the authority to coordinate Federal actions and funding in the Great Lakes, but in our opinion, it has never fully exercised this authority.

Finally, I would like to highlight the lack of a comprehensive, widely accepted set of indicators and a monitoring system for determining whether the overall state of the basin is getting better or worse. Although the call for such a monitoring system can be traced back to the original agreement, after several past and ongoing attempts to develop such a system, this requirement remains largely unmet.

We recommended in our report that EPA, one, in conjunction with other Federal agencies in the Great Lakes States, develop an overarching strategy that clearly defines roles and responsibilities for coordinating and prioritizing funding projects; two, submit to the Congress a time-phased proposal for funding this strategy; and three, develop indicators and more particularly a monitoring system for measuring overall restoration progress and for evaluating the merits of alternative restoration projections. EPA agreed with our conclusion but has not yet formally responded to these recommendations.

Mr. Chairman, that concludes my statement and I will answer any questions later.

Senator VOINOVICH. Thank you, Mr. Stephenson.

Our next witness is Robyn Thorson. She is the Region III Director for the Fish and Wildlife Service. Welcome.

TESTIMONY OF ROBYN THORSON,[1] REGION III DIRECTOR, U.S. FISH AND WILDLIFE SERVICE

Ms. THORSON. Thank you, Mr. Chairman. I ask that my written statement be submitted for the record.

Senator VOINOVICH. Without objection.

Ms. THORSON. We appreciate the opportunity to be here today at this hearing to bring more focus to efforts currently underway and to accountability in the Great Lakes. I am the Midwest Regional Director for the Fish and Wildlife Service, which includes Ohio, Indiana, Iowa, Michigan, Minnesota, Missouri, Wisconsin, and Illinois and is headquartered in the Twin Cities.

[1] The prepared statement of Ms. Thorson appears in the Appendix on page 161.

The Fish and Wildlife Service's mission is to work with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people, and to do that, by working with others. We work with the agencies that are at this table, with tribes in the Great Lakes, with communities, with associations and non-governmental organizations, and most significantly, with the States.

I am going to list just a few examples of the kind of work that the Fish and Wildlife Service is doing in the Great Lakes, and I will point out that the GAO's report on page 26 identified the numbers of Great Lakes-specific programs that each Federal agency has in the Great Lakes and the Fish and Wildlife Service had the most on that list.

One example is the binational sea lamprey control program, which represents an effective and comprehensive strategy contributing to restoration goals for the Great Lakes. It is administered under the leadership and coordination of the Great Lakes Fishery Commission. The U.S. Fish and Wildlife Service implements the sea lamprey control program, along with the U.S. Geological Survey and Canada's Department of Fisheries and Oceans. This has been going on since 1955, an outstanding international example of tackling the invasive species problem effectively and it needs to continue.

The Fish and Wildlife Service is also signatory to the joint strategic plan for management of Great Lakes fisheries, originally adopted in 1981, along with State, provincial, Federal, and tribal agencies from the United States and Canada. The joint strategic plan agencies have developed consensus-based objectives for the structure of each of the Great Lakes fish communities and the means of measuring progress toward their achievement. This is most evident on Lake Superior, where lake trout populations have been largely restored, and restoration of coaster brook trout and their habitats is well underway.

Similarly, the Great Lakes Fish and Wildlife Restoration Act, which Congress initially authorized in 1990, facilitates partnerships to achieve basin-wide comprehensive programs to assess the ecological status of the Great Lakes, and the Fish and Wildlife Service is preparing a report to Congress covering our activities under the Act from 1998 to 2002.

The Fish and Wildlife Service also assists private land owners, townships, and county governments, with projects that benefit fish and wildlife resources. These are through our programs called Partners for Fish and Wildlife, the Coastal Program, and the Fish Passage Program. We provide technical assistance and seed money, just a bit of funding to get these started, for locally-led projects. They may seem small on scale compared to some of the larger programs like sea lamprey, but they are so important for citizen-centered governance, so important to Secretary of the Interior Gale Norton, and for citizen stewardship of natural resources. We are pleased to provide technical assistance and funding to these programs.

To address the issue of chemical contaminants as ecological stressors in the Great Lakes, the Fish and Wildlife Service has a unique role using principles of ecotoxicology and ecological risk as-

sessment to determine actual or likely effects of contaminants on fish and wildlife.

And last, among the most critical threats to the Great Lakes is that posed by invasive species. Our efforts, those of our partners, and the National Invasive Species Council are focused on control of existing problems, such as the lamprey and the zebra mussel. And we must also address the threat that the Asian carp pose to the Great Lakes as they appear to be moving up the Mississippi River system.

Construction of the electric barrier in the Illinois waterway is one example of a partnership effort to control invasive species and protect the waters and habitats of the Great Lakes, and I must pay a compliment to the Corps of Engineers for their leadership in this and particularly the City of Chicago for the Aquatic Invasive Species Summit that was recently sponsored to bring together engineers as well as environmental interests, and the transportation industry, to collectively address this critical problem.

The Fish and Wildlife Service agrees that there will be great benefit from a comprehensive strategy to achieve restoration in the Great Lakes and that environmental indicators and a monitoring system must be part of any plan to achieve success. The Fish and Wildlife Service stands ready to continue its leadership role in fish and wildlife restoration and expand its work with partners to make the world's largest freshwater ecosystem a balanced and healthy environment for fish and wildlife and people. Thank you.

Senator VOINOVICH. Thank you very much.

Mr. Skinner, glad to have you here.

TESTIMONY OF THOMAS V. SKINNER,[1] REGION V ADMINISTRATOR, AND NATIONAL PROGRAM MANAGER FOR THE GREAT LAKES, U.S. ENVIRONMENTAL PROTECTION AGENCY

Mr. SKINNER. Mr. Chairman, thank you. It is a pleasure to be here. Senator Coleman, as well, it is an honor to be in front of you today, and as I look around the room, for today's purposes, to be with Senators from the two greatest States in Region V. [Laughter.]

I am Tom Skinner, the Region V Administrator. I am also, in that role, the National Program Manager for EPA's Great Lakes Programs, and it is a pleasure to be here today with you to discuss briefly the General Accounting Office report, EPA's programs, and progress that has been made in protecting this Nation's irreplaceable Great Lakes ecosystem.

I want to first take this opportunity to strongly reaffirm EPA's commitment to the Great Lakes as well as to the role and responsibilities set forth for the Great Lakes National Program Office, which we refer to as GLNPO, under Section 118 of the Clean Water Act. That Act requires GLNPO to serve as the lead for coordinating the protection and restoration of the Great Lakes system within the agency, as well as with other Federal agencies, the eight Great Lakes States, tribal authorities, and with the appropriate federal and provincial agencies in Canada.

[1] The prepared statement of Mr. Skinner appears in the Appendix on page 164.

EPA and GLNPO have made significant progress along with our partners, and that is important, along with our partners. We have built a sound, comprehensive ecosystem management structure for the Great Lakes guided by adaptive management. The Great Lakes system is not static and we must adapt to the ever-changing challenges of protecting this magnificent resource, which, as you all know, contains 20 percent of the world's fresh surface water.

The April 2003 GAO report made a number of recommendations, many of which we agree with, but a few of which we don't. EPA will submit its formal response to the GAO report later this month.

Today, I would like to take the opportunity to outline what EPA, along with its partners, is doing with regard to coordination. I will highlight the programs and coordinating mechanisms we are using to effectively manage the Great Lakes program to achieve environmental results and to ensure that this magnificent resource is protected now and for future generations.

GLNPO convened the U.S. Policy Committee, which is compromised of senior-level representatives of Federal, State, and tribal agencies with significant natural resource and environmental protection authorities and responsibilities. While the U.S. Policy Committee is not backed by a statutory mandate, it has become an effective vehicle for coordinating priorities of basin-wide significance for the Great Lakes.

The Great Lakes Strategy 2002 is a product of the U.S. Policy Committee and serves an important function by focusing on multi-lake and basin-wide environmental goals that those governmental partners will work toward. It supports efforts underway, including the lake-wide management plans and remedial action plans for Areas of Concern, by addressing issues that are beyond the scope of these programs and helping integrate them into an overall basin-wide context. We believe that the Great Lakes strategy has helped to meet and exceed the requirements for coordination specified in Section 118 of the Clean Water Act.

The strategy was released in April 2002 by former Administrator Whitman in Muskegon, Michigan. The plan is groundbreaking and includes major objectives that are both measurable and time-phased. Ten Federal agencies, eight Great Lakes States, and tribal authorities assisted in its consensus-based development. We are now implementing the strategy and tracking progress.

Some of the key goals, by 2005, clean up and delist three Areas of Concern with a total of 10 by 2010. By 2007, reduce concentrations of PCBs in lake trout and walleye by 25 percent from year 2000 levels. And by 2010, 90 percent of Great Lakes beaches to be open 95 percent of the season. Finally, by 2010, substantially reduce the further introduction of invasive species, both aquatic and terrestrial, to the Great Lakes basin ecosystem.

I would also like to touch briefly in the little time that I have left on our efforts to increase the knowledge base and to develop strong scientific underpinnings for the decisions we make. The State of the Lakes Ecosystem Program, also known as SOLEC, was created by EPA and Environment Canada. SOLEC fulfills, in part, the requirement in the agreement for assessing and reporting progress. SOLEC is held every 2 years. It is science-based. It is a

collaborative effort that includes many stakeholders as well as governmental partners from both sides of the basin.

SOLEC has four objectives, to assess the state of the Great Lakes ecosystem based on accepted indicators; to strengthen decisionmaking and management; to inform decisionmakers of Great Lakes environmental issues; and to provide a forum for communication and networking among all stakeholders.

Four SOLEC reports have been issued since 1995, with the 2003 report to be released next month. Over 800 indicators have been reviewed and a suite of 80 indicators has been identified to assess the health of the Great Lakes.

Now, turning to monitoring for a moment, we have a multi-agency system of monitoring for the Great Lakes that involves a variety of expertise. A cost-effective system should be binational in scope since there are economies of scale. Numerous agencies on both sides of the border are contributing to our monitoring programs, ensuring that the best scientific expertise is applied to the Great Lakes.

Now, of course, as the GAO notes, we can always improve our efforts to coordinate and to strive for clearer accountability and implementation and we are committed to doing just that. We want to make sure that the Great Lakes are healthy for both wildlife and people. We want future generations to enjoy their beauty and magnificence, and we consider ourselves all to be stewards towards this end. Because I also serve as the mayor of a Great Lakes community, Lake Bluff, Illinois, I take this responsibility particularly seriously.

I would like to thank you, Mr. Chairman, and Senator Coleman, for inviting me to speak here today.

Senator VOINOVICH. Thank you very much, Mr. Skinner.

Mr. SKINNER. Thank you.

Colonel Ryan.

TESTIMONY OF COL. WILLIAM E. RYAN, III,[1] DEPUTY COMMANDER, GREAT LAKES AND OHIO RIVER DIVISION, ARMY CORPS OF ENGINEERS

Col. RYAN. Thank you, Mr. Chairman. I ask that my complete statement be submitted for the record and I will try to summarize and conserve time.

Senator VOINOVICH. Without objection.

Col. RYAN. Mr. Chairman, I am pleased to testify before you on the restoration of the Great Lakes. The U.S. Army Corps of Engineers supports efforts to improve the management of the programs for the protection and enhancement and restoration of the Great Lakes environment. I look forward to continuing to work with our sister agencies and other partners on approaches for moving the restoration of the Lakes forward.

I will begin my comments with a response to the recent General Accounting Office report on the Great Lakes restoration needs, provide an overview of the Corps' Great Lakes programs, and offer some recommendations for future steps to enhance the management of the Great Lakes programs.

[1] The prepared statement of Col. Ryan appears in the Appendix on page 176.

The recent GAO report includes a description of the Corps of Engineers programs that are available to support the environment protection and restoration of the Great Lakes basin. We have found that the inventory of Federal and State programs for the Great Lakes contained in the GAO report is comprehensive and are using them in one of our ongoing studies.

The Corps agrees with the GAO that an effort is needed to help coordinate the various restoration programs in the Great Lakes basin and a comprehensive monitoring system with selected indicators is necessary to measure progress in restoring the ecosystems of the Great Lakes system.

Primacy for water resources management in the United States has been and must continue to be at the State and local level. While it is appropriate for the Federal Government to be involved in issues of international, national, or multi-State significance, such as the management of the Great Lakes water resources, it is the States and in particular governors who should be establishing the priorities for management of these shared water resources.

The diversity and environmental issues on the Great Lakes basin has spawned a number of intergovernmental organizations and committees to coordinate one or more specific issues, whether it is invasive species, wetland restoration, water management, nonpoint source pollution, or contaminated sediment. A significant amount of planning and coordination has already been accomplished through these existing organizations and committees, including the U.S. Policy Committee, the Great Lakes Commission, the Council of Great Lakes Governors, and the Great Lakes Fishery Commission.

The environmental issues that are facing the Great Lakes are numerous and complex. Great Lakes issues include contaminated sediments, invasive species, groundpoint source pollution, and water management within a framework of two countries, eight States, and two provinces.

We believe that restoring the Great Lakes resources will benefit from a watershed perspective, emphasizing collaboration and integration. Success will require the participation of all interested parties in the planning and the decisionmaking process, and this participation will foster an open dialogue to integrate sometimes competing or conflicting water resource needs. Such integration and collaboration are indispensable to meeting the water challenges.

The Corps has a variety of civil works programs that are being utilized for the protection and enhancement and restoration of the Great Lakes ecosystem. The size and importance of this water resource and the complexity of the challenges before it necessitate a team approach to its management. The Corps has worked as a team member, as well as a team leader, in different aspects of the collective environment programs for the Great Lakes basin.

The Corps has been a member of a team that monitors, predicts, and regulates water withdrawals, flows, and diversions through our support of the International Joint Commission Board of Control and Reference Studies. The Corps has been a member of the U.S. Policy Committee and participates in the development of a strategic plan to facilitate the implementation of the Great Lakes Water Quality Agreement.

Perhaps the most significant program the Corps has led to date is the removal and confinement of contaminated sediments from Federal navigation channels in the Great Lakes. Although this program is conceived as to measure from environmental protection rather than restoration, the Corps, in partnership with State and local governments, has removed over 90 million cubic yards of contaminated sediments from the Great Lakes through this program.

Through a more recent program, the Corps is currently leading projects for environmental dredging at eight Great Lakes Areas of Concern in partnership with State and local agencies.

The Corps has four basin-wide studies ongoing that are addressing our specific or general water resources needs of the Great Lakes. The first of these is the U.S.-Canadian collaborative study of existing navigation infrastructure in the Great Lakes and St. Lawrence Seaway.

The second is a basin-wide study, is an inventory of biohydrologic information relevant to the Great Lakes water management and will complete a gap analysis of water-related data.

The third is a basin-wide study we have initiated in partnership with the Great Lakes States. It is an evaluation of the economic benefits of recreational boating in the Great Lakes, and in particular those utilizing the Federal navigation system.

And the fourth is the Great Lakes study the Corps is helping to develop as a plan in collaboration with the Great Lakes Commission. It was authorized by the Water Resources Development Act of 1999. This study will produce a report to Congress with an analysis of existing water resource needs identified by the Great Lakes States and stakeholders and recommendations for new or modified authorities to address unmet needs.

The Corps is pleased to have had this opportunity to appear before you and provide testimony on this important subject. Mr. Chairman, this concludes my remarks.

Senator VOINOVICH. Thank you, Col. Ryan. Mr. Keeney.

TESTIMONY OF TIMOTHY R.E. KEENEY,[1] DEPUTY ASSISTANT SECRETARY FOR COMMERCE FOR OCEANS AND ATMOSPHERE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Mr. KEENEY. Mr. Chairman, Members of the Subcommittee, I am Tim Keeney, Deputy Assistant Secretary of Commerce for Oceans and Atmosphere. On behalf of NOAA's Administrator, Vice Admiral Conrad Lautenbacher, I would like to thank you for inviting me to testify today.

Mr. Chairman, I would also like to add up front that we believe that the "O" in NOAA, which is the National Oceanic and Atmospheric Administration, includes the Great Lakes and we are very much involved in that region.

Mr. Chairman, I ask that my complete statement be submitted for the record.

Senator VOINOVICH. Without objection.

Mr. KEENEY. As other witnesses have pointed out, the Great Lakes are one of the earth's greatest treasures and the Nation's

[1] The prepared statement of Mr. Keeney appears in the Appendix on page 181.

single most important aquatic resource. Today, I will focus my remarks on two areas, NOAA's response to the recent GAO report and NOAA's programs related to restoration efforts in the Great Lakes.

NOAA shares the concerns raised in the recent GAO report on the Great Lakes. Although many Federal, State, and local programs are already working together on this task, better coordination would help all partners to work together more effectively to restore the Great Lakes ecosystem. Improving the consistency of performance metrics among the agencies involved and better coordination of the Great Lakes monitoring programs would provide information necessary for reliably evaluating progress toward regional restoration goals.

NOAA has environmental stewardship assessment and prediction responsibilities in the Great Lakes. We conduct research and environmental monitoring and modeling, providing scientific expertise and services to manage and protect the Great Lakes ecosystem. NOAA's Great Lakes restoration programs and partnerships, the topic of today's hearing, are a topic of great priority. NOAA's restoration role includes advising on cleanup of contaminated sites, working with States to fund habitat restoration projects, and conducting research and monitoring activities. I would like to highlight a few examples of our work in the region.

NOAA works with EPA and other agencies at contaminated sediment sites in the Great Lakes to protect the aquatic environment, to clean up these sites, and to reduce overall injury to natural resources and speed their recovery. NOAA is currently working on cleaning up and restoring 18 hazardous waste sites in the region. NOAA also partners with seven of the Great Lakes States through the Coastal Zone Management Program to protect, restore, and responsibly develop the Nation's important cultural resources. In Ohio, for example, NOAA has provided funding to coastal communities and organizations to develop comprehensive land use plans, improve access to Lake Erie's shoreline, and conduct research and education.

NOAA's Great Lakes Coastal Restoration Program, which as funded through a $30 million appropriation in fiscal year 2001, is an excellent example of our recent restoration efforts. More than 70 local government units have partnered in this program and are working on a variety of restoration projects, including contaminated sediment cleanup, invasive species removal, dune and marsh restorations, acquisition of critical habitat, and stormwater management.

Activities coordinated by NOAA's Sea Grant College Program, a partnership between the Federal Government and the Great Lakes Universities, develop and implement methods to restore habitat. Sea Grant extension agents empower coastal communities in the region to undertake well-planned coastal development that preserves and promotes restoration of critical coastal habitats.

NOAA has established the National Center for Aquatic Invasive Species Research to develop a coordinated research plan to address invasive species issues. The Center will foster partnerships among NOAA and other entities to address prevention, early detection,

rapid response, and management of invasive species, a major restoration issue for the Great Lakes ecosystem.

Finally, NOAA has recently awarded two grants that will further the restoration planning for the Great Lakes. Under these grants, the Great Lakes Commission and the Northeast-Midwest Institute, in partnership with the Great Lakes Sea Grant Network, will provide technical and scientific support to the region's leadership in the development of a comprehensive ecosystem restoration plan. The Institute will review the approaches that other regions have used to launch major ecosystem restoration initiatives in order to provide guidance for Great Lakes planning efforts.

The Commission will facilitate a series of State and province focus groups, culminating in a Great Lakes restoration forum that will identify restoration priorities and associated strategic actions. This effort will help unify the many existing strategic plans from partner agencies.

NOAA looks forward to working in partnership with EPA, States, and others in this effort.

Thank you, Mr. Chairman. I look forward to answering your questions.

Senator VOINOVICH. Thank you, Mr. Keeney.

Mr. Keeney, I have to tell you that I was not aware of what NOAA was doing. I mean, I am very familiar with the Sea Grant program and what Jeff Reutter is doing up at our lab in Ohio, the Stone Lab. I have been very much involved in coastal management and setting requirements for those people that live on Lake Erie. They have got to talk about erosion, and then lake access.

Mr. KEENEY. Mr. Chairman, I would love to come by and visit with you and your staff.

Senator VOINOVICH. It is interesting that you have gone through a number of things, and the Army Corps of Engineers is involved. The EPA is involved, Fish and Wildlife. Is there an orchestra leader that knows what all of you are doing and is coordinating it?

[No response.]

Senator VOINOVICH. Mr. Stephenson, let us start with you. Mr. Skinner indicated that there were some things they agreed with and some that they disagreed with. I wasn't aware of the Great Lakes Strategy 2002. Would you like to comment on that?

Mr. STEPHENSON. Well, I think from each of our witnesses, you heard that each has a restoration strategy, and that is exactly the point. There is no overarching strategy that orchestrates all these efforts, sets clear priorities and time frames for accomplishing things, and assigns specific responsibilities to the various partner agencies.

So we can agree to disagree how much authority the Clean Water Act gives the Great Lakes National Program Office. We think that the authority clearly resides there for developing this overarching plan. That is why we made our recommendation to EPA. By the number of programs, the number of dollars, the number of activities that you heard, all of which have noble objectives and noble strategies, we just don't think these are well put together and well coordinated at this point.

Senator VOINOVICH. Do you think that EPA should be the orchestra leader in keeping track of what everybody is doing?

Mr. STEPHENSON. You could establish a new body, which I think the legislation refers to an advisory board and a coordination council. It just has to be clearly set up in the legislation who has that responsibility for decisionmaking, setting priorities, and so forth. We think that EPA is in a good position to develop such an overarching strategy and we think that the current legislation gives them that authority.

Senator VOINOVICH. Along with several of my colleagues, we sent you a letter requesting a follow-up study to examine what indicators and monitorings are needed in the Great Lakes and what additional research is necessary. As I stated earlier, when I was governor, we created and released the Lake Erie Water Quality Index in 1998. I think it is a very important piece of the restoration effort, to have these indicators. Simply put, we need to be able to measure if we are doing any good and highlight what is going on. I have always said, and when I was governor I used to say, if you can't measure it, don't do it.

And I don't know if you have seen this or not, but it is interesting. We came up with a Great Lakes Water Quality Index. The issue was, what are the indicators? We had water quality, pollution sources, habitat, biological, coastal recreation, boating, fishing, beaches, tourism, and fishing. I suspect there are some people here that might say there may be some more indicators that you have on here.

What we tried to do is then rate them. I know that Chris Jones is here and I am anxious to have a State of Ohio update of where we are in this. Have we made any progress or haven't we made any progress? What are the things that were bad in 1998, what projects have been undertaken, and so on, so that we get this kind of restoration effort moving.

I would like to see this kind of thing done for the entire Great Lakes, understanding that each of the Great Lakes are different. It is amazing, the difference between, say, Lake Superior and Lake Erie. Lake Erie is the greatest fishery of the Great Lakes, although, I think from testimony here of Fish and Wildlife, things are coming along in that regard in some of the other lakes. We really need to get on with this and then have the strategy so we can make it happen.

I would like comments from all of you. Do you think that the EPA should be the leader of this kind, keeping track of what everyone is doing and kind of being the focus place for putting a plan together?

Ms. THORSON. Senator, we would value an orchestra leader, as you characterize it, and working with the EPA has been a successful partnership for the Fish and Wildlife Service. We can continue to accommodate that, or in agreement with the GAO if there is a different coordinator. But so much of the strategizing to date has been more cataloging of effort than coordination of effort, and increasing that coordination by working together under existing authorities or under new coordination, all would be beneficial.

So we support either direction, the current leadership of EPA or new coordination, as long as there is coordination.

Senator VOINOVICH. Any other comments on that, in terms of an orchestra leader?

Col. RYAN. Sir, I would also say we also need to look at the binational aspect of the Great Lakes as we are trying to put that together. Obviously, for the Federal Government, the U.S. Federal Government, we need an orchestra leader, but we also have to look at our neighbors to the North and how do we coordinate that whole aspect together from a binational standpoint.

Senator VOINOVICH. Mr. Keeney.

Mr. KEENEY. Mr. Chairman, I serve on the South Florida Ecosystem Restoration Task Force for the Department of Commerce and I think that task force works pretty well. As has been mentioned by some of my previous commenters, we also support a multi-agency effort based in the Great Lakes which would include Federal, State, and regional groups working on this restoration effort. EPA would make a fine orchestra leader, but obviously, we need to have all of the players intimately involved.

Senator VOINOVICH. Well, I am going to bring this up because Mr. Schornack may bring this up in his testimony and I have you here, Mr. Stephenson. The International Joint Commission Chairman writes in his testimony that the Great Lakes National Program Office doesn't "have the power, the budget, or the reach to really direct programs over multiple Federal agencies and multiple levels of government. So never mind if I differ with the GAO report when it asserts that GLNPO has failed by not effectively coordinating work of the other 12 agencies that are involved in restoration activities." Do you want to comment on that statement? Mr. Schornack, I think you are going to make it when you get up here to testify, and——

Mr. STEPHENSON. I think what we are saying is that EPA was clearly given the authority, for the U.S. portion of the agreement, for performing that coordination function. Do they need more resources to do that? Probably so. I don't know why GLNPO hasn't taken on more of this requirement than it has. Mr. Skinner will have to answer that. I am simply stating that for our legislation here in the United States, that we think that EPA was already given that authority.

That is not to say that a newly-established legislative body might also serve as a great orchestra leader. I think either way can work, but they have got to be provided the resources and responsibility for doing that very clearly.

There needs to be interagency agreements between the Federal agencies, as well. There are no formal interagency agreements right now to implement any of these strategies.

Senator VOINOVICH. Mr. Skinner, do you have the money and the budget to do the job?

Mr. SKINNER. Mr. Chairman, the resource issue is one that faces us and is daunting. Whether we have the resources depends on how our role is defined. I think the answers to your question from three of my four colleagues up here prove the point that I was going to make, which is that with all due respect to GAO, they may believe that the authority resides in GLNPO right now to do what they think needs to be done. Unfortunately, our sister agencies don't seem to agree with that. I mean, I didn't hear any of the three say, yes, EPA currently has the authority to do what is suggested. That is a big problem that we face. We are glad to take on

that mantle of responsibility, but it may well be that if that is to be our responsibility, some clarification is necessary to make sure that we are all on the same page as to that role.

Senator VOINOVICH. So if you are selected, then you think that it should be very clear that you have the interagency responsibility and that everybody knows that you are the coordinator. And just as important would be the budget and resources that you would need to get the job done and how you would interface, for example, with other agencies so that you don't have duplication.

Would you agree that is really the genesis of any of this that we are talking about today to get everybody together to clearly define who the leader is and what their responsibility is, what the responsibilities are to the other agencies that are involved, and then also look at the international aspects of this, which is very important.

And last, but not least, I think to get some input in from the other players. For example, Great Lakes United has some very good recommendations. And then I am sure there are some—I know when I was Chairman of the Council of Great Lakes Governors that we dealt with some of the industrial groups that were there when we did the GLI, Great Lakes Initiative, that started out as being a gigantic thing. We tried to get it down to really dealing with the bio-accumulative stuff that was within the Great Lakes.

Ms. Thorson, you state in your testimony the Fish and Wildlife Service is developing and supporting environmental indicators of this ecosystem through your engagement with the EPA Great Lakes National Program Office, the U.S. Policy Committee, and the State of the Lakes Ecosystem Conference, SOLEC. Could you tell me a little bit more about these indicators that you have developed? Have you ever seen this? (Holding up Lake Erie Water Quality Index)

Ms. THORSON. No, I haven't, Mr. Chairman, and I would like to see it.

Senator VOINOVICH. Yes. I would be interested in just seeing how it fits in with what you are doing. Do you care to comment?

Ms. THORSON. Yes. We like measurables. It helps us all focus and it also helps assign responsibility. Under SOLEC, the Fish and Wildlife Service happens to have responsibility for several particular environmental indicators like lake trout, lake sturgeon, and bald eagles, predictably, the ones within our jurisdiction. Beyond that, we also have the capability for measuring progress in wetlands restoration and other particulars. So we are measuring under SOLEC some specific assignments. We have greater capability of bringing to the table some measurables in a coordinated Great Lakes effort.

Senator VOINOVICH. So the thing is there is some really good stuff going on there. It is a question of how do you focus in.

Col. Ryan, you are dealing with sediments, right?

Col. RYAN. Yes, sir.

Senator VOINOVICH. And Mr. Keeney, you are dealing with some other things that I have down here.

Mr. KEENEY. Restoration.

Senator VOINOVICH. Yes, but——

Mr. KEENEY. Research.

Senator VOINOVICH. For example, sediments, Col. Ryan, you said you have done some work in the sediments area. Do you have a backlog of all the sediment projects? How far along are we?

Col. RYAN. Well, we are concerned principally with the Federal navigation channel, so it doesn't encompass the total of all the contaminated sediments. Obviously, there are some outside those channels that we don't deal with, and I don't have those figures but I could get those for you.

Senator VOINOVICH. I am familiar with some of the work by the National Bureau of the River, for example, but I funded that program with $7 million or $8 million when I was Governor of Ohio and it is still not done. You did one of the creeks that go into that and I was amazed at how the Corps went in and actually diverted the water and did the cleanup. It was an amazing project.

I would suspect that you have a tremendous backlog of things that need to be done and haven't got the funding to take care of it.

Col. RYAN. That is correct. It is priorities and the amount of resources available.

Senator VOINOVICH. And then the issue then becomes, too, about the EPA and the Army Corps of Engineers, that some of the restoration project people are concerned about whether it is ecologically the thing to do. It is all of these little nuances that get involved in all of this.

Before I take the next panel, do any of you want to comment on what anyone has said here or give me your final feelings on anything?

Mr. STEPHENSON. I think we said it all in our report. The next project that you have asked us to do is take on this indicator development and monitoring system approach for the Great Lakes. You can see there is a lot of good work going on in different pockets, but the same thing is going to be at issue here. How can we coordinate all this work and develop meaningful indications—maybe Ohio has the answer with its indices project, but behind that must be a monitoring system for collecting the data. Even SOLEC says of its 80 indicators that less than half of them have credible data with which to measure against——

Senator VOINOVICH. I am going to have Chris Jones up here and I am going to ask him the question of——

Mr. STEPHENSON. Good.

Senator VOINOVICH [continuing]. What monitoring have they been doing and who have they been working with in order to come up with a new report.

Mr. STEPHENSON. Monitoring is kind of a hodgepodge right now. There are not specific standards for sampling. Water quality data varies all over the board. So there is a lot of work that needs to be done in that area. We have good air deposition monitoring, but not much good water quality data monitoring.

Senator VOINOVICH. I remember the fiasco we had when we were—Mr. Schornack probably will remember this—when we were doing the advisories on fish and the differences of opinion. One State wanted to write one and the other didn't. We wanted to coordinate it and I don't think we ever did finish it up. Everybody did their own thing. So some of these things that we are talking

about here as being kind of easy to do, when you really get down to them, are not that easy.

Mr. STEPHENSON. It is very difficult.

Senator VOINOVICH. Yes. Mr. Keeney.

Mr. KEENEY. Mr. Chairman, to build on the recommendations provided in the GAO report, NOAA can identify five steps that would strengthen and speed restoration of the Great Lakes, and if I could, I would just like to go over each one of them very briefly.

Senator VOINOVICH. OK.

Mr. KEENEY. First, leadership is needed to develop a regional restoration plan. Some of these things, of course, have already been mentioned today.

Second, once the unified restoration plan is in place, successful implementation will require increased and improved coordination.

Third, we must build on current monitoring efforts that are being implemented by NOAA, EPA, and the Great Lakes States in order to gauge the health of the Great Lakes.

Fourth, NOAA agrees with the GAO recommendation to document success of restoration projects. In order to do this, we suggest creating and maintaining a project management database.

And fifth, the fundamental requirement for the Great Lakes restoration is ecosystem-level research that will lead to scientifically-based management in the restoration decisions. Thank you.

Senator VOINOVICH. Thank you. Again, I held a hearing in Cleveland on the dead zones and we talked about zebra mussels, and you didn't mention the quagga mussels that are much larger and what they are doing. The point was, in terms of research, they are not sure yet what impact they are really having on the Great Lakes. We have had zebra mussels—in fact, when I was mayor, I held the first hearing on zebra mussels in the United States. It was 1989 or 1988 that we held it. Think of that. All this time has passed and we still haven't authoritatively decided what impact it has had on the ecology of the lake.

Thank you very much for being here today. I really appreciate it.

Mr. SKINNER. Mr. Chairman, I just, in summation, want to say thank you for your continuing leadership on this issue, not only with regard to Lake Erie, but the Great Lakes in general, and offer GLNPO and EPA's willingness to work with you as you move forward and try and navigate your way, if you will, through these waters. Thank you.

Senator VOINOVICH. Thank you.

Ms. THORSON. Thank you, Mr. Chairman.

Senator VOINOVICH. Our next panel of witnesses, and I will introduce them as they come forward, our first panelist is Dennis Schornack, who is the Chairman of the United States Section of the International Joint Commission; the Hon. Susan Garrett, who is an Illinois State Senator, District 29; Chris Jones, the Director of the Environmental Protection Agency in the State of Ohio on behalf of the Council of Great Lakes Governors; and Margaret Wooster, Executive Director of Great Lakes United.

Again, I would like to remind the witnesses that I would like you, to the best of your ability, to limit your remarks to 5 minutes.

Prior to your giving your testimony, would you stand. I would like to swear you in, also.

Do you swear the testimony you are about to give is the truth, the whole truth, and nothing but the truth?

Mr. SCHORNACK. I do.

Ms. GARRETT. I do.

Mr. JONES. I do.

Ms. WOOSTER. I do.

Senator VOINOVICH. Let the record show that they all answered in the affirmative.

Mr. Schornack.

TESTIMONY OF DENNIS L. SCHORNACK,[1] CHAIRMAN, U.S. SECTION, INTERNATIONAL JOINT COMMISSION

Mr. SCHORNACK. Thank you, Chairman Voinovich, for the opportunity to address the complex and vitally important issue of managing the restoration of the Great Lakes.

I have the honor today of being accompanied on my right by Hon. Herb Gray, my co-chair of the International Joint Commission and the former Deputy Prime Minister of Canada.

The operating principles of the IJC, our independence, the equality of commissioners and countries, our binational, science-based approach, and our objectivity, make the IJC the ideal watchdog over how well the countries keep their promises under the Great Lakes Water Quality Agreement. The IJC plays a key role in assessing progress and assisting in the implementation of this agreement.

In our Areas of Concern report, the IJC corroborated the GAO findings that a lack of monitoring data, lack of restoration targets, and even the lack of something so simple as maps of each area of concern, make an assessment of progress virtually impossible. Moreover, after 16 years, we found that the countdown to clean—two areas cleaned up and 41 to go—is proceeding just too slowly.

The IJC also agreed with previous reports of the GAO and its Canadian counterpart regarding the lack of coordination and the need to set clear lines of authority and accountability in order to properly manage the programs and assess the progress towards restoring beneficial water uses in Areas of Concern.

When three independent agencies from two separate countries reach one conclusion, the result is a very powerful triangulation of opinion that is both legitimate and valid. Incredibly, the same three independent organizations also reached the same conclusions regarding both United States and Canadian management of alien invasive species in the Great Lakes, the number one threat to biodiversity in the ecosystem. Invasive species put both our ecology and our economy at serious risk, and frankly, no one is in charge of solving the problem.

While Congress envisioned the Great Lakes National Program Office to be the key agency responsible for managing and coordinating restoration programs, the reality is they don't have the power, the budget, or the reach to really direct programs over mul-

[1] The prepared statement of Mr. Schornack with an attachment appears in the Appendix on page 190.

tiple Federal agencies and multiple levels of government. They do a good job of coordinating work within EPA, but to fault them for not coordinating activities in the Commerce Department, Interior, or in Agriculture, is simply unfair.

With all the concerns that have been identified today, what should we do? I believe the answer lies in the Great Lakes Water Quality Agreement. It is the fabric that binds together our two great nations and the single ecosystem we share. The agreement has a great purpose, creating a three-legged stool that supports an ecosystem approach to restore and maintain the chemical, physical, and biological integrity of the Great Lakes. What we need now is to breathe new life into the agreement to bring it into the 21st Century and to refocus national and international attention and action on restoring the greatness to the Great Lakes.

While the agreement calls for a government review every 6 years, it was last updated in 1987, some 16 years ago. Perhaps the time has come to reexamine the agreement, bring it in line with state-of-the-art science, and address contemporary ecological challenges.

Questions such a review must answer include, is there a proper balance across the goals of physical, chemical, and biological integrity? Are agencies organized and managed to achieve these goals? Are there new technologies and new ways of thinking that could speed the pace of restoration? And who should monitor compliance and how?

For example, the agreement commits the United States and Canada to a coordinated monitoring and surveillance program to assess compliance, measure progress towards specific objectives, and identify emerging concerns. However, as the GAO report notes, in 1987, this responsibility was shifted away from the IJC into the EPA and Environment Canada. It has subsequently languished for lack of commitment and resources. As a result, the IJC, the independent watchdog, is dependent upon the very government programs that we evaluate for the data upon which to evaluate them.

So I commend you, Chairman Voinovich, and the cosponsors of S. 1398 for recognizing this unfulfilled promise in the agreement and for taking action to do something about it. I caution you, however, to preserve the independence of the IJC and to make sure that implementation of this Act will provide us the data and the tools necessary to do our job and to do it right.

I also believe that updating the agreement could form the basis for a major binational Great Lakes initiative. Binational and bipartisan momentum for such an initiative is clearly growing and many organizations already have plans that reflect the consensus that something significant must be done. We don't need to create new and competing agencies, but rather give the Great Lakes National Program Office the power, the authority, and the budget they need to coordinate, and indeed, to direct work across Federal agencies and between the United States and Canada.

And permit me to be so bold as to suggest that this time, the Great Lakes Water Quality Agreement could be submitted to the Senate for ratification, to strengthen it and to give it treaty status, making sure that promises made in writing become promises kept in action.

Thank you, and that concludes my remarks, and I ask that they be submitted for the record.

Senator VOINOVICH. Thank you. Ms. Garrett.

TESTIMONY OF HON. SUSAN GARRETT,[1] ILLINOIS STATE SENATOR, DISTRICT 29

Ms. GARRETT. Good morning, Senators Voinovich and Durbin. It is an honor to testify before the Subcommittee today. Thank you for the invitation to share my views on the critical issue of the Great Lakes restoration management.

First, I would like to talk about the State and local government perspective. In 2002, I was elected to the Illinois State Senate to represent Legislative District 29. Before that, I served in the Illinois State General Assembly for two terms, representing Congressional District 59. Both of these districts include communities directly on the shore of Lake Michigan, and all of the communities I have represented are in a close proximity to a local lakefront recreational area.

As a public official, I know how much pride my constituents take in Lake Michigan. It is a place where families go to enjoy recreational activities, like swimming and boating, the source of our drinking water, and an icon and resource for a variety of local and regional businesses.

Part of my role as State Senator is to collaborate with other State and local officials in critical issues in my district. Collaboration and coordination is the key to successfully strengthening our communities.

The GAO report makes several critical points, including the need for enhanced coordination and better data collection and monitoring. However, while the report discusses at length the role of Federal agencies, governors, and other organizations, it does not go in depth regarding the role of other public officials, including State legislators and municipal officials. Today, I would like to share my perspective as a local official representing a district with very tangible ties to Lake Michigan in order to aid the findings of the GAO report.

From a local perspective, Great Lakes restoration is an environment issue, but it is also an economic, educational, public health, and equity issue. My constituents value environmental protection efforts because they want to see their children and grandchildren enjoy Lake Michigan just as they have. The ecological system of the Great Lakes is home to 250 species of fish and several protected coastal areas and other public lands. We need to protect this ecological system from environmental threats, including invasive species, pollution, and habitat destruction.

Today, I want to tell you about one of the clearest challenges we face on the Illinois side of Office of Management and Budget, high E. coli contamination. The presence of the harmful E. coli bacteria requires regular and frequent beach closings in order to protect public health. As I am sure the Subcommittee will agree, this is not acceptable. My constituents consider Lake Michigan our most valuable natural resource. We can no longer allow for our beaches to

[1] The prepared statement of Ms. Garrett appears in the Appendix on page 228.

be closed so often during the summer months with any real understanding as to what is causing these extremely high bacteria levels.

Some have claimed that sea gulls are the culprit of this high E. coli contamination. Others say raccoons and deer. Human sewage is another serious consideration. Locally, I have established a Clean Water Trust Fund that will provide the funding, much of which is coming from the grassroots, to do necessary testing that will determine the cause or causes of the E. coli contamination. The objective is to independently raise approximately $25,000 to cover the costs of an E. coli water sample study to determine whether sea gulls, deer, raccoons, human sewage, or a combination of all these elements are leaving harmful contaminants in Lake Michigan.

While we must work together throughout the Great Lakes region, we must not ignore the fact that a lot of problems need local involvement and localized solutions. This is why we are working with several State and local entities, including the Illinois Department of Public Health, Illinois Environmental Protection Agency, Lake County Health Department, Lake Michigan Federation, businesses such as Baxter's, Chicago Medical School, and two independent scientists to pursue this study. This broad-based group of stakeholders indicates the strong level of local interest and expertise in these issues, but also highlights how important it is to coordinate and not duplicate efforts.

Since embarking on this research effort, we have received E-mails and letters asking for more information from other communities and States, such as Michigan. These kinds of responses indicate a clear need for local, State, and Federal Government to be more proactive in understanding the water quality of Lake Michigan, as well as the other Great Lakes, and to map out a plan to reverse the current trend of pollutants continually threatening our Great Lakes. It also shows the need for a more comprehensive approach to collecting and understanding environmental data and indicators.

The recommendations that I would suggest for improving Great Lakes restoration management, I would say that one of the most important things is to have a central office to go to with Great Lakes concerns and questions. We need a "go to" person, a one-stop shopping place where we can assess the resources and programs that can help us work together to restore the Great Lakes.

For this reason, I am especially interested in the opportunity for the Great Lakes National Program Office to provide coordinated efforts on the issue of water quality, which is part of the DeWine-Levin proposed legislation that I understand the Chairman and Ranking Member support. It is critical to have a strategic, collaborative approach to improving the water quality of our Great Lakes.

In addition, I support the establishment of an advisory board, another piece of the Senate and House legislation, which will help bring all the stakeholders together to plan for the future of our Great Lakes. It is especially critical to engage the participation of mayors and other public officials on this board and I am happy to be here today with the Village President of Lake Bluff, Thomas Skinner. Local citizens' groups and other forums for public participation are also essential.

I want to thank you for your time and I will also submit my testimony for the record.

Senator VOINOVICH. Thank you very much. Mr. Jones.

TESTIMONY OF CHRISTOPHER JONES,[1] DIRECTOR, ENVIRONMENTAL PROTECTION AGENCY, STATE OF OHIO, ON BEHALF OF THE COUNCIL OF GREAT LAKES GOVERNORS

Mr. JONES. Thank you, Senator Voinovich and Senator Durbin, for allowing me to appear on behalf of Governor Bob Taft representing the Council of Great Lakes Governors on the important topic of restoring one of the world's most important ecological treasures, the Great Lakes.

The region's governors are pleased with the leadership Congress has shown in recognizing the critical importance of the Great Lakes and the pressing need to restore and safeguard them for generations to come. We particularly commend Senators DeWine and Levin for the introduction of their restoration bill this week and the Members of this Subcommittee who are cosponsors.

The Great Lakes Governors recognize the need for an overarching plan that identifies specific restoration goals, establishes priorities, specifies measures of success, and serves as a coordinating focus for the many Federal, State, and local programs directed at Great Lakes restoration. Toward that end, the Council began working on the Great Lakes Priorities Project in 2001. The goal of the project is to develop such a plan in consultation with the Great Lakes mayors and other stakeholders. With the plan serving as both a scientific foundation and a policy funding consensus, the Great Lakes community can work with Congress to identify and procure the funding necessary to fully achieve its goals.

We are somewhat behind the original schedule we set for ourselves, as five newly-elected governors in the Great Lakes States have needed time to familiarize themselves with the restoration programs in their States and the aims of the Council to coordinate a basin-wide approach. Recent conversations between Governor Taft and several other Great Lakes Governors, however, confirm the joint purpose and resolve of the Council. In fact, we are near to having a final set of priorities for the Great Lakes restoration. Our priorities will reflect broad goals, such as the protection of human health, restoration of habitat, and control of invasive species.

The Council believes that the bills now pending in the House and Senate offer an opportunity to focus much-needed financial resources on these priority needs. At the same time, the governors wish to be clear that it is likely that restoration costs for the national treasure that is the Great Lakes ecosystem could and probably will run well beyond $6 billion. A more precise figure cannot be arrived at absent the development of a comprehensive plan.

What is important in the near term is continuing the focus on restoration efforts, and the DeWine-Levin bill does just that. Both States and the Federal Government have made substantial invest-

[1] The prepared statement of Mr. Jones appears in the Appendix on page 233.

ments in this important resource and we want to expand and continue that good work.

The Council has already demonstrated its commitment to collaboratively address Great Lakes issues on a regionwide scale through Annex 2001, an amendment to the Great Lakes Charter that addresses water diversions and in-basin consumptive uses from the Great Lakes. The Council is well on the way to meeting the Annex 3-year time line for development of binding agreements, which will include a decisionmaking standard to guide water withdrawals. This will also achieve the first of the governors' priorities.

The recent GAO report notes that States devoted nearly $1 billion in the time period reviewed to Great Lakes-specific projects, versus $745 million spent by Federal agencies and the Corps of Engineers together. Illinois, for example, has spent $6 million to restore coastal habitats. Michigan has committed $25 million to sediment remediation, while Minnesota spends $1.2 million each year to control invasive species. New York has devoted approximately $22 million to open space preservation projects in the Great Lakes basin, and in Ohio, we have directed $25 million to conservation projects in the Lake Erie basin.

The region's governors have individually and collectively demonstrated the will and the leadership to invest in a wide range of restoration projects and stand ready to pull together a region-wide plan that can guide further progress.

A necessary component of the plan will be environmental indicators by which progress can be measured, and I know that you have spoken of the need for a set of indicators for all the Great Lakes, Senator Voinovich, similar to the Lake Erie Index that you developed while you were Ohio Governor.

The GAO report correctly notes that the development of indicators has been the purpose of SOLEC over the past several years and that a set of indicators has not been finalized. No one should underestimate what a difficult task this is, especially given the diversity and geographic expanse of the Great Lakes basin. Nevertheless, it is imperative that this effort move forward more expeditiously than has been the case to date, and a good system of indicators will form the basis of both accountability and measurement of success.

The governors find much to commend in the GAO report and agree with its primary conclusion that the multitude of programs directed at the Great Lakes need to be better coordinated and focused. However, the Council disagrees with its recommendation that the restoration efforts be directed by GLNPO. Clearly, GLNPO has an important role to play, particularly with regard to the binational aspects of Great Lakes restoration. Other existing Great Lakes organizations and stakeholders are also key players. For example, the Great Lakes Commission can contribute valuable scientific and technical expertise. But we believe that it is the role of the region's governors to establish policy priorities in consultation with local governments and other stakeholders and to plan specific activities to achieve those priorities.

Thank you very much for the time, Senator.

Senator VOINOVICH. Thank you, Mr. Jones. Ms. Wooster.

TESTIMONY OF MARGARET WOOSTER,[1] EXECUTIVE DIRECTOR, GREAT LAKES UNITED

Ms. WOOSTER. Thank you, Mr. Chairman and Subcommittee Members, for inviting Great Lakes United to testify today on government management in the context of Great Lakes ecosystem restoration. We applaud the leadership of the Great Lakes Task Force in both the House and Senate in bringing this issue to the fore and we support these issues to promote Great Lakes restoration and look forward to working with you to make them happen. I also want to commend the GAO study, which we thought was excellent.

Great Lakes United is an international coalition of individuals and over 170 organizations representing hundreds of thousands of individuals from the eight Great Lakes States, two Canadian provinces, and tribal territories within the Great Lakes region. Our main constituents are environmental organizations, like National Wildlife Federation, Lake Michigan Federation, Sierra Club; conservation organizations like Trout Unlimited; and labor groups, like Canadian Auto Workers and United Auto Workers. We work with all of them at the local, regional, and international level on projects and policies to protect and restore the health of the ecosystem.

To that end, over the past 2 years, Great Lakes United coordinated 30 Great Lakes groups in the creation of a citizens' action agenda, a summary of which, The Great Lakes Green Book, is over on the table and is presented with this testimony. It can also be found on our website at www.glu.org.

Several of these groups that I mentioned, including National Wildlife Federation, Lake Michigan Federation, Sierra Club, and a few others, had input into the testimony that I am reading today.

I am going to skip forward. The GAO report rightly points out that we need an overarching strategy that clearly defines agency roles and priority funding for Great Lakes restoration. We would like to elaborate on four major needs raised in the report. These are funding, agency coordination, public involvement, and finally, one that isn't really raised in the report but we feel is really important, the need to go beyond existing policies and programs.

First, I will talk about funding. For at least the past decade, there has been a lack of funding for even the most basic protection and restoration efforts, like monitoring and cleanup, as the GAO report notes. For example, the IJC estimates it will cost $7.4 billion to clean up just the U.S. Areas of Concern, those 31 hot spots in the United States or shared with Canada.

Congress recently approved the Great Lakes Legacy Act, authorizing $53 million per year for 5 years for sediment cleanup, which we hoped would restart cleanup efforts in the Great Lakes. But the funding proposed in the 2004 budget was only about one-third of that, or 0.2 percent of the total estimated cost.

My point here is not to be ungrateful. Fifteen million to help restart sediment cleanup efforts is a good beginning. But my point here is to really point out the discrepancy between the amount and the need.

[1] The prepared statement of Ms. Wooster appears in the Appendix on page 237.

We need a dedicated revenue stream over a period of at least 10 years sufficient to complete the job, the job of sediment cleanup. Every year we wait makes the job harder and costlier and prolongs a major source of ecosystem damage.

Next, coordination. At this point in time, there is no one Federal agency and no consortium of State agencies with the capacity to develop and oversee a Great Lakes restoration initiative. We need an independent body which defines goals, targets, and time lines and accordingly prioritizes the projects that should be funded. This body should be led by the region's representatives, Federal, State, local, and tribal, with strong citizen involvement, strong public accountability in terms of meeting its charge, and a mechanism for cross-border coordination. It should define criteria for funding projects to help leverage restoration goals.

I want to just comment on that to say that S. 1398, with its Great Lakes Advisory Board led by the States and cities and tribes in the region, and then with its Federal agency coordinating committee led by GLNPO, is a beginning, we think, of a very good model for how this coordination should happen.

Public involvement—there must be a strong public role in Great Lakes protection and restoration. The public must be represented on any advisory body, Federal or State, that determines a restoration plan and priorities for fundable projects. There should also be opportunity for wide public comment on restoration plans at strategic points in their development. In other words, inclusion of groups like Great Lakes United and the others in this process is important to us, but also we think we are going to need hearings along the way so that the wider public in the Great Lakes has a chance to contribute to the development of plans for Great Lakes restoration.

Finally, policy change. This is something we haven't talked about, but we feel that—and our groups felt in creating a citizens' agenda for the Great Lakes that this was very important. There are a number of policy and institutional changes that are critical. I will offer two examples.

One, we need to extend the focus of our strategies beyond reacting to ecosystem harm to proactive initiatives. For example, toxic reduction strategies must include support for policies and programs that create alternative choices in Great Lakes communities, such as incentives for resource conservation, green energy, and pollution prevention.

Two, we need to carefully appraise the mandates of existing institutions with the greatest influence on Great Lakes waters, such as the U.S. Army Corps of Engineers, who accounted for almost half the U.S. Federal environmental spending in the Great Lakes over the past 10 years, according to the GAO report. The Corps' traditional mandate has been to protect and enhance private property, not ecosystems. In fact, improvements in the name of flood control, navigation, and shoreline hardening are usually directly detrimental to ecosystem health. Therefore, it is important that if agencies like the Corps have a role in Great Lakes restoration, that it be tightly defined and publicly accountable.

Thank you again for this opportunity to speak.

Senator VOINOVICH. Thank you, Ms. Wooster.

As I mentioned earlier, your entire statements will be included in the record and some of us will have questions that we want to direct to you and we would appreciate your answering them in writing.

Senator Garrett, you mentioned the E. coli problem, and I really wasn't aware that there was that much increase of it along the Great Lakes. You are trying to do something in your own community to determine it. First of all, are you aware of the Great Lakes Protection Fund?

Ms. GARRETT. To a certain extent, but I have reached out to many organizations and government entities and the ones that we have put on our panel are the ones who have been the most responsive.

Senator VOINOVICH. Yes, because we, when I was governor, the Great Lakes Council of Governors set up a $100 million endowment for——

Ms. GARRETT. Maybe I will be calling them.

Senator VOINOVICH [continuing]. For the research—yes, and they are right in Chicago. They give grants to various organizations to deal with various problems that confront the Great Lakes, and it seems to me that if this is a problem that is universal, that they ought to be willing to put some money into helping you get the research done.

The other thing is, are there Federal agencies that are involved right now in trying to look at that same issue?

Ms. GARRETT. The Lake Michigan Federation provided me with some charts, which I will leave, but what the charts demonstrate is that the E. coli levels along our beaches are continually going up at a fairly frequent level and this is very disturbing information.

And to the point of bringing in local, Federal, and State agencies, it is within our own communities that we have made the decision to do this testing and there has been resistance. So I think it is important to note that, that it may not have been able to happen through some of these other groups that you have been talking about.

Senator VOINOVICH. Well, you have got the Great Lakes National Program Office that is in Chicago.

Ms. GARRETT. Yes.

Senator VOINOVICH. Have you contacted them about that issue and are they doing anything about it?

Ms. GARRETT. We have not contacted them. We have stayed with—currently, we are working with the Lake Michigan Federation, the Illinois Department of Public Health, the Environmental Protection Agency, the Lake County Health Department, and we have received funding. We clearly are almost to where we need to be.

But the fact of the matter is, I wasn't sure who to reach out to, and in some cases, it was a struggle when I did reach out, and people were in agreement—the constituents, my constituents, want to see this happen. But I guess my point, and I want to make this clear, is that there is resistance to this because no one community wants to admit that there may be human sewage from their community going into the lake, and I think that if they understood that there were dollars that will help upgrade those sewer systems or

whatever may be the problem, that we need to find those dollars. But first, we have to understand what is causing the high E. coli levels.

Senator VOINOVICH. But it gets back to if you had one "orchestra leader" that knew what all the organizations were doing and where the problems were and where the funding sources were, that might be very helpful to everybody, because your problem is the same as, I assume, a lot of other places. I understand that they are afraid to do it because that gets back to what Ms. Wooster had to say, and that it is the funding.

One of the things that we have struggled with in the Environment and Public Works Committee was increasing the amount of money for the State Revolving Loan Fund for Clean Water. It is not there. We are mandating all kinds of things for local governments and they don't have the resources to deal with them. So that is another aspect of this, looking at the big picture.

Do you think that your local organizations would be—and this is the same question I would like to ask Chris Jones—comfortable with working with the Great Lakes National Program Office. I mean, what do you think about them being kind of the host or the orchestra leader in terms of putting this all together?

Ms. GARRETT. I personally like that idea, because I think while the EPA does a wonderful job, I think this issue is specific to the Great Lakes. We have different issues associated with the Great Lakes, and an organization that fully understands those problems will be willing to listen and understand how to address those concerns is a group I would personally like to work with.

Senator VOINOVICH. We talked about something called SOLEC, the State of the Lakes Ecosystem Conference, which has been created by the BEC. I think, Dennis, you said something about the fact that they are not moving. Who is responsible for SOLEC? They are to be developing, what, some standards to assess the indicators in terms of water quality. Who is in charge and where is the money coming from to fund them?

Mr. SCHORNACK. Well, I will give that a try, Senator. The Binational Executive Committee, the BEC, as you have named it, consists of leadership by the Environmental Protection Agency of the United States and co-chaired with Environment Canada. They are in the process of identifying indicators of ecosystem health, and it has been—they do this through a matter of a series of conferences——

Senator VOINOVICH. But do they do that in terms of the IJC? Are you the ones that have orchestrated this agreement and do they kind of respond to you, or——

Mr. SCHORNACK. We have motivated and urged the development and implementation of indicators and have been a party to that process going on for 9 years. Currently, we have about 80 indicators, but we only have data to partially support 33 of them, and there are things like the levels of PCBs in coho salmon, the numbers of beaches closed, and the quality of the drinking water.

Those are the top three indicators that we think SOLEC ought to be focusing on, is making sure that the data is there, because these are the three top things the public cares about. Are the beaches open for swimming? Are the fish safe to eat and is the

water safe to drink? We would like to see them, as a matter of advice, develop the data and the testing, the monitoring programs to substantiate those three indicators first before moving on to the other 77.

Senator VOINOVICH. OK. I have some more questions on that, but first, Senator Durbin.

Senator DURBIN. Thank you, Mr. Chairman, and Senator Garrett, thank you for being here. I wanted to make sure you were invited to be part of the panel because I know you have a special perspective on this, since, I think, you have lived most of your life near Lake Michigan and certainly have represented Legislative and Senatorial districts on Lake Michigan.

I think Senator Voinovich has given us a good idea about going after some resources to deal with some Illinois challenges, and perhaps if we drop his name we will be more successful in that effort. [Laughter.]

We certainly will try to do that. But I think it really tells a story that you are trying to gather together $25,000 to do some testing and that you are struggling to find a source for that small amount, relatively small amount by even State standards, let alone Federal standards. It also reinforces the conclusion of the GAO that we just aren't coordinating this well enough. We are not sharing enough information so that people know exactly where to go to try to get a good community response to this. So I think this legislation moves us in the right direction, so thank you for being with us today.

Ms. Wooster, you talked about money, and that is always a great topic in this town, and the fact that we haven't come up with much. We have done a lot of talking about this, but we haven't come up with much money. If I recall your testimony here, you said that the International Joint Commission identified 31 toxic hot spots with an estimated cleanup cost of $7.4 billion. If I understand you correctly, despite that estimated cleanup cost, Congress's proposed 2004 budget proposes, what, $16, $17, $18——

Ms. WOOSTER. I think it is $15 million.

Senator DURBIN [continuing]. Fifteen million out of a $7.4 billion need just for those hot spots, as they were identified.

This bill that we are talking about supporting and want to see passed, if I understand it, authorizes about $6 billion, which is certainly a move in the right direction, but in comparison, the Everglades bill has $14 billion included. Now, I don't want to suggest that our challenge is as great as theirs. We need to justify every dollar that we request. But I think your figures really tell the story. If we are not going to invest the money once we have identified the problem, then we are going to have a wonderful unread report when this is all over instead of an action plan to do something, and I don't want to see that occur. I guess that is, from your organization viewpoint, your thought, as well.

Ms. WOOSTER. Yes. We have got the largest freshwater ecosystem in the world here and we don't have investment nearly commensurate with its importance. We think people are beginning to understand the importance of the Great Lakes ecosystem as the largest freshwater ecosystem on earth, but we still haven't got the funding there to support its protection and restoration. So yes, the $4 billion, or $6 billion, I should say, is a very great improvement

and it is probably not all that will be needed to do the job, but it is a very great start.

Senator DURBIN. We are facing record deficits now, as was reported yesterday, and I know the States are going through the same. Senator Garrett has just finished a legislative session and I assume that—I hope that this area wasn't cut, but did our State of Illinois have to reduce any of its State funds that would have been dedicated for some of our discussion purposes here?

Ms. GARRETT. I do not think so, and I also know that the Lieutenant Governor has set up his own Clean Water Trust Fund. I think we are going to be talking about drinking water and other things that will be subsidized through that fund.

Senator DURBIN. Thank you very much. Thank you, Mr. Chairman.

Senator VOINOVICH. Thank you, Senator Durbin.

One of the questions I have is that the Great Lakes National Program Office, and Chris, maybe you could answer this, is that—all of the Great Lakes are not in just Region V, are they?

Mr. JONES. No, Mr. Chairman. There are six States in Region V. There are eight States and two provinces that are on the Great Lakes.

Senator VOINOVICH. So it is Region V and what is the other regions?

Mr. JONES. Regions II and III are also in the Great Lakes.

Senator VOINOVICH. So you have Regions V, III, and II, but the Great Lakes National Program Office has been charged with dealing with all of the Great Lakes. Is there a jurisdictional problem there? At least it is all in that basket.

Mr. Schornack, what kind of relationship do you have with the Great Lakes National Program Office right now, the International Joint Commission?

Mr. SCHORNACK. Well, I would consider it a very productive relationship and one that—we rely upon the Great Lakes National Program Office for much of the data that we use to do our assessing function, our sort of independent watchdog function, on how well the two governments implement the terms and conditions of the Great Lakes Water Quality Agreement and that works very fine for programs that are under EPA's jurisdiction. But it gets less effective, however, when we are looking at things like habitat loss, where we have to cut across different Federal agencies. That is where we have some difficulty, I think, getting information.

Senator VOINOVICH. So you have got the Great Lakes Water Quality Agreement and you indicated that it hasn't been updated since 1987, is that right?

Mr. SCHORNACK. That is right.

Senator VOINOVICH. Do you think that would be a useful document? Does that include criteria for various levels of things——

Mr. SCHORNACK. Yes, sir, it does.

Senator VOINOVICH [continuing]. Like the indicators in terms of these kinds of things, the water quality, pollution sources, and so on and so forth?

Mr. SCHORNACK. It does. There are, in fact, some 64 different specific objectives for the amount of some 46 different classes of

chemical substance in the open water column and those specific objectives have to be met and things have to be monitored.

I think the one point I was trying to make in sort of suggesting the notion of a treaty is that if—the Water Quality Agreement calls for a surveillance and monitoring program, but it is an agreement. It is a gentlemen's handshake that has moral authority, not the legal authority of a treaty. And if this were part of a treaty, it would actually be a matter of law. It would be done.

Senator VOINOVICH. So the reason why you think that you would want to have that Water Quality Agreement updated, that it could act as the consensus of what it is that both the U.S. and Canadian Government would want as far as indicators of what you would be measuring?

Mr. SCHORNACK. Exactly.

Senator VOINOVICH. That would be your consensus——

Mr. SCHORNACK. Right. There isn't——

Senator VOINOVICH [continuing]. So the IJC fundamentally, then, is the body that is charged with looking after the Great Lakes between the United States and Canada, is that correct?

Mr. SCHORNACK. That is correct, sir.

Senator VOINOVICH. And then Mr. Gray works with you and he is with the Canadian Federal Government.

Mr. SCHORNACK. That is right, and we operate as a unitary and joint body. We reach our decisions by consensus and do joint fact finding as our sort of vehicle for arriving at the facts.

Senator VOINOVICH. Mr. Jones, what is the Council of Great Lakes Governors, which is made of all the governors in the Great Lakes States, opinion of this legislation that we have? How would you feel about working with, and what is your relationship with, the Great Lakes National Program Office?

Mr. JONES. Senator, the Great Lakes Governors, in a sense, think that there are different functions. We believe that it should be the governors of the Great Lakes States that set the prioritization for a plan. Earlier, with the earlier panel, you talked about the indices that we have in Ohio. What we did was build off the index that was released in 1998, and in 2000, we released the Lake Erie Protection and Restoration Plan, which takes the index measurements and specifically assigns—there are 84 specific tasks that match up with various indices and there is a State agency responsible for implementing that specific task. We are now in the process, now that we have the initial index and the restoration——

Senator VOINOVICH. Who are you talking about now? You are talking about——

Mr. JONES. This is the State of Ohio.

Senator VOINOVICH. OK.

Mr. JONES. But I think it sets a framework that I think is important, because now we are going back for the second round to look at the index that was completed in 1998. So we have to measure again. But critically important is the overarching plan. The overarching plan has to be built on the data that you collect and it has to be built upon the priorities that you set.

We speak of the Great Lakes. There are fairly significant differences between the Great Lakes and the Everglades. For example, the Everglades is essentially one ecosystem in one State. Here,

you have a number of very different ecosystems in a number of different States, three different EPA Regions, and two Canadian provinces. So the complexities are that much more there and it is that much more important to get the type of local input that you are well able to do through the governors, through the State Government, reaching out.

We have already been in discussion with the Great Lakes mayors, and one of the things we did in Ohio was—once we had the index, we went out and did 16 different focus groups across the lake, from Ashtabula to Toledo, to get input on what are the significant things you want us to measure to be able to answer the question. As Mr. Schornack says, what people want to know is, can I drink the water? Can I swim? So it is that process of building the plan and prioritizing your work and then measuring the work that you do to produce results at the end.

I guess I see the GLNPO not so much as directing, but in coordinating, perhaps, and being the central point of focus, but I really think the States need to drive the prioritization because the States are going to be much more sensitive to, for example, the local concern about E. coli, which runs the gamut—I mean, all of the Great Lakes have that issue in one form or another, but there may be a local specific need to address.

Senator VOINOVICH. The problem is, and that is one of the things that I am talking about, how do you organize this thing. That is going to take a lot of brainstorming, a lot of people sitting down. I suggested to Ms. Wooster that maybe we ought to have a day where we get all the groups together and just start talking about how would you organize this thing, and the governors want to do this.

But you know and I know that I happen to be really interested in Lake Erie because it was my baby when I was in the State legislature and I followed it. A lot of governors really aren't that concerned about their Great Lake, whatever it is. It is not the driving factor. Maybe in Illinois, but there are some other places, maybe New York—and then you get new governors in, and they are so busy right now just trying to stay above water in terms of their finances that the last thing they are thinking about probably is whatever Great Lake they are responsible for.

So you need some kind of a continuing effort that is in place to keep this going, and I would really be interested in what the Council of Great Lakes Governors would say about—is this the same thing with, like, the IJC? When I was there, we would invite the premiers down to be involved with us when we were doing these things. I am sure that the premiers have been involved now in, what do we call it, the withdrawal, what is the name of that?

Mr. JONES. The Annex 2000.

Senator VOINOVICH. The Annex 2000. I am sure you are consulting with the premiers involved in that. But, Dennis, I don't think we went to the IJC and maybe we should have done that as kind of saying, you are the international group. How do we interface with you in terms of this?

I am just saying that to figure out how all this is to get done is going to be a real challenge. Would the governors not be com-

fortable if the Great Lakes Office were the one that would be the kind of orchestra leader and coordinator of this thing?

Mr. JONES. Mr. Chairman, the way I understand the legislation, I think it is a good first step because it sets up an advisory board and a Federal coordinating agency, and I think the manner in which you establish the advisory board and the level of input that board has can meet the concerns of the governors in terms of providing our prioritization, the governors' prioritization of the work that needs to be done and at the same time allow the Federal agency to coordinate it.

I think the framework with this bill, and I think why it is so encouraging to see this legislation, is there to do what you say, and it is, I mean, just in the State of Ohio, we have the Lake Erie Commission to try to coordinate the activities of six different State agencies for our part of one of the Great Lakes.

So it is certainly not a simple task, but I think perhaps what difference there is really seems to be a tremendous amount of momentum to move forward with this. I think one of the things you have heard this morning from a lot of different people is not nay-saying and negative, but we are all here to try to make this work and your leadership and Senators DeWine and Levin and the Members of the Subcommittee, I think that is what can help us put this giant group of people together.

Senator VOINOVICH. Well, it is going to be a major effort, but we all agree that it is—we need a symbiotic relationship and the more we can cooperate then the better off we will be to figure out how to get this done.

Dennis Schornack was saying about the Great Lakes Water Quality Agreement needing to be updated. It seems to me that if you did that and got involved in it, that could be the standard, in other words, instead of having you do your thing and then the governors come along and say, well, we are going to do something else, and then the EPA comes up—we would kind of agree and say, they are working on it. They have got the resources and they have got to do it.

The other thing that I think when talking about money is that—I am very much involved in the Everglades—is that it is a 50–50 proposition, as you know, in terms of funding. So if you went ahead and you started investing money, you would have to have priorities about where are we going to put the money and then is there going to be some State participation in it or is this just going to be all the Federal Government. That would have to be sorted out.

Those are questions that are very important, and getting back also to some of the stuff that is just basic Federal responsibility. We talk about sewers and Safe Drinking Water and Clean Water. There is a big area here where there is a lot more effort that has to be made. There are certain systemic things that are fundamental to restoration of the Great Lakes and that has got a lot to do with just some other Federal programs that need to be looked at and folded in, as well as, I am sure, in terms of Canada and some of what they have got to do.

Does anyone else have any other comments before we close this hearing, adjourn it?

[No response.]

Senator VOINOVICH. I really thank you very much for coming and I am excited about the prospects. You will be hearing more from us and certainly you will be getting some questions from me. Thank you very much.

The meeting is adjourned.

[Whereupon, at 12:08 p.m., the Subcommittee was adjourned.]

APPENDIX

UNITED STATES SENATOR • OHIO

Mike DeWine

FOR IMMEDIATE RELEASE
JULY 16, 2003

CONTACT: AMANDA FLAIG
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Statement by U.S. Senator Mike DeWine (R-OH), co-chairman of the Senate Great Lakes Task Force:

Good morning. I thank the Chairman, my good friend and fellow Ohioan, Senator Voinovich, for holding this important hearing today and for inviting me to be here to testify. It's good to see such a strong showing from the Great Lakes delegation. We all know that the Lakes are such an extraordinary treasure for our region.

The Great Lakes are a unique natural resource that needs to be protected for future generations. They hold one-fifth of the world's surface freshwater, hold an estimated six quadrillion gallons of water, cover more than 94,000 square miles, and drain more than twice as much land. The Great Lakes ecosystem includes such diverse elements as northern evergreen forests, deciduous forests, lake plain prairies, and coastal wetlands. Over 30 of the basin's biological communities -- and over 100 species -- are globally rare or found only in the Great Lakes basin. The 637 state parks in the region accommodate more than 250 million visitors each year. And, the Great Lakes basin is home to more than 33 million people -- that's one-tenth of our entire U.S. population!

Unfortunately, the Great Lakes remain in a degraded state. I would like to cite GAO's April report that says, "Despite early success in improving conditions in the Great Lakes Basin, significant environmental challenges remain, including increased threats from invasive species and cleanup of areas contaminated with toxic substances that pose human health threats." (p. 11) In 2001, there were nearly 600 beach closings as a result of e-coli bacteria, and state and local health authorities issued approximately 1,400 fish consumption advisories in the Great Lakes. In the years since the United States and Canada signed the Great Lakes Water Quality Agreement and agreed to give priority attention to the 43 designated Areas of Concern, the United States has not been able to remove any of the U.S. sites from the list of Areas of Concern. And, invasive species continue to establish themselves in the Great Lakes, and there are now more than 160 non-native species living in our Great Lakes.

Senator Levin and I have worked together as co-chairs of the Great Lakes Task Force since 2000. We have fought to secure needed Great Lakes funding for the NOAA water level gauges, the replacement ice-breaking vessel, the Mackinaw, and sea lamprey control money for the Great

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Lakes Fishery Commission. We both met with the U.S. Trade Representative in an effort to prevent water from the Great Lakes from being diverted abroad. And, we also worked together to authorize the Great Lakes Basin Soil Erosion and Sediment Control Program in the 2002 Farm Bill. Last fall, we passed the Great Lakes Legacy Act, which provides up to $50 million per year to the EPA to clean up contaminated sediments at Areas of Concern. The President provided $15 million in his FY04 budget to get this program started.

These steps, in conjunction with the efforts by our states, are positive, but unfortunately -- based on the federal government's current level of funding -- we are not able to keep pace with the problems facing the Great Lakes. An April 2003 GAO report found that the federal government has spent about $745 million over the last 10 years on Great Lakes restoration programs. Now, consider the fact that the GAO reported that the eight Great Lakes states spent $956 million during that same 10-year period. Mr. President, the federal government is simply not spending enough to protect and improve the Great Lakes -- one-fifth of the world's freshwater.

When Senator Levin and I and the other members of the Great Lakes Task Force asked for a GAO study on restoration efforts in 2001, we knew some of the challenges facing the Great Lakes. Many of us were growing frustrated by the status quo of Great Lakes programs. We wanted to understand how management of the Great Lakes compared with the management of the Chesapeake Bay, the Everglades, San Francisco Bay and other large aquatic ecosystems.

Though GAO is scheduled to report on its findings shortly, I want to highlight a few key findings in its report. First, GAO found that both federal and state officials cited a lack of funding as the chief barrier to restoration progress. Second, there are several Great Lakes environmental restoration strategies, but they are not coordinated. Third, GAO was not able to provide a comprehensive assessment of the restoration progress in the Great Lakes based on the indicators and monitoring system.

Based on this information, Senator Levin and I, along with our colleagues -- Chairman Voinovich, Senator Durbin, Senator Coleman, Senator Stabenow, Senator Clinton, and Senator Schumer -- introduced the Great Lakes Environmental Restoration Act. This bill will build upon the efforts by the Great Lakes states, which have convened a Working Group to establish their Great Lakes goals and priorities. Many of our regional interest groups and agencies have prepared strategic plans and priorities. And, we have brought in the President's Council on Environmental Quality so that the President will better understand the value of a long-term plan for the Great Lakes. I can't emphasize how important it is to have all of these interests working toward the same goal.

A Great Lakes Restoration program must be an equal partnership between the local, state, and

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federal governments and other interested citizens and organizations. I believe that this legislation would provide the tools needed for the long-term future of the Great Lakes. First, this legislation would create a $6 billion Great Lakes Restoration Grant Program to augment existing federal and state efforts to clean up, protect, and restore the Great Lakes. In the April 2003 GAO report, the GAO reported that insufficient funding is often cited as a limitation to restoration efforts. Therefore, an additional $600 million in annual funding would be appropriated through the EPA's Great Lakes National Program Office, and the Program Office would provide grants to the Great Lakes states, municipalities, and other applicants in coordination with the Great Lakes Environmental Restoration Advisory Board. This funding would provide the extra resources that existing programs do not have.

While the Great Lakes are a national and international resource, I believe that the region, not the bureaucrats in Washington, needs to be setting its priorities and guiding the future efforts on the Lakes. This bill would require very close coordination between the EPA and the state and regional interests before grants are released. The Great Lakes Environmental Restoration Advisory Board, led by the Great Lakes governors, would include mayors, federal agencies, Native American tribes, environmentalists, industry representatives, and Canadian observers. This Advisory Board, which would include all of the interests in the Great Lakes, would provide priorities on restoration issues, such as invasive species control and prevention, wetlands restoration, contaminated sediments clean up, and water quality improvements. Additionally, this Advisory Board would provide recommendations on which grant applications to fund. Ultimately, the input from the Advisory Board would mean that the region would be involved in determining the long-term future of the Great Lakes.

As the April 2003 GAO study reported, environmental restoration activities in the Great Lakes are uncoordinated. So, the second goal of this legislation is the establishment of a Great Lakes federal Coordinating Council to coordinate federal activities in the Great Lakes. The EPA's Great Lakes National Program Office would serve as the Council leader, and participants would include the key federal agencies involved in Great Lakes work, such as NOAA, the Army Corps of Engineers, the Department of Agriculture, and the Department of Interior. The Council would meet at least three times per year to ensure that the efforts of federal agencies concerning environmental restoration and protection of the Great Lakes are coordinated, effective, complementary, and cost-efficient. The Council also would provide a list of its funding priorities to the Office of Management and Budget.

Finally, our bill would address the GAO's second recent finding that environmental indicators and a monitoring system for the Great Lakes need to be developed to measure progress on new and existing restoration programs.

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Mr. Chairman, the Great Lakes Task Force and the efforts of other members have certainly impacted the Lakes for the better. I am very proud that I have secured over $34 million for Ohio and the Great Lakes states for projects that have helped protect and restore the Lakes. I am proud to have sponsored the Great Lakes Legacy Act with Senator Levin, which will provide funds to the EPA to cleanup contaminated sediment at Areas of Concern, and I'm very pleased that the President included $15 million in the Administration's fiscal year 2004 budget to initiate this program. Also, I believe that the National Invasive Species Council Act, which I am sponsoring, and the National Aquatic Invasive Species Act, which I am cosponsoring, will help reduce the number of new invasions of non-native species. But, these are efforts aimed at very specific problems in the Great Lakes. As the GAO noted, there is no over-arching plan to coordinate our efforts. I hope that the Congress is able to work with the states in order to coordinate a long-term vision for the Great Lakes. The Great Lakes are such a unique resource, that we must do all that we can to protect them for the future.

Thank you.

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Senator Carl Levin
Great Lakes Restoration Hearing
July 16th, 2003

Good morning Mr. Chairman and Ranking Member. I want to thank you both for the opportunity to testify this morning on the state of Great Lakes environmental restoration. The Chairman's home state of Ohio and the Ranking Member's home state of Illinois may not have quite as much coastline as Michigan, but I know that you both are very concerned about protecting and improving the health of the Great Lakes ecosystem.

The GAO report, which will be discussed shortly, provided a good overview of the many programs operating in the Lakes such as contaminated sediments, invasive species, and non-point source pollution, but I think it is also important to note we have been able to create management programs in the Great Lakes that have been successful. For example, the Great Lakes Fishery Commission and its partners have been able to reduce sea lamprey populations by 90%. Sea lampreys are very aggressive creatures that attach to large fish, feeding on them and often killing the host fish. By controlling the sea lamprey, many of the native fish in the Great Lakes have been able to show signs of recovery. Another fishery success story is that the lake sturgeon appears to be improving as a result of the efforts by federal and state managers, fishermen, and other water users.

As of April 2002, approximately 84 percent of high-level PCB wastes had been destroyed, up from approximately 40 percent in spring 1998. And the first U.S. Area of Concern–Presque Isle Bay, PA–has been upgraded to a "recovery area." The Great Lakes Critical Programs Act, which I authored back in 1990, strengthened the water quality standards in the Great Lakes region by creating water quality criteria to protect aquatic life, human health, and wildlife, and the EPA estimates that this program will reduce direct toxic water discharges by six to eight million

pounds per year. Last year, Congressman Ehlers, Senator DeWine and I were successful in passing the Great Lakes Legacy Act to addresses the problem of contaminated sediments at the Areas of Concern. Based on information that was gathered in 1999 by the EPA, more than 1.7 million cubic yards of contaminated sediment have been removed or treated at a cost of more than $300 million at the 32 U.S. Areas of Concern in the Great Lakes. While these figures are impressive, there is so much more to be done.

I am also hopeful that Congress will be able to take the next step toward invasive species prevention in the Great Lakes by passing the National Aquatic Invasive Species Act.

While the Great Lakes have made strides in recovering, problems still exist. In the many years since the Great Lakes Water Quality Agreement was signed, the United States has not been able to fully restore and delist an Area of Concern. There are still hundreds of fish advisories issued every year, and the number of beach closings seems to be increasing. As the GAO reported, limited funding has been a barrier to restoring the Great Lakes, and I believe that the Federal commitment to the lakes has not kept up with the needs of the Great Lakes. Other problems reported by the GAO were the lack of coordination on a restoration strategy and the lack of a coordinated indicators and monitoring system.

As Senator DeWine said earlier, we decided that it was time to address the concerns outlined by the GAO. The Great Lakes Restoration Act, which we introduced yesterday and similar legislation was introduced by Congressmen Emanuel and Reynolds in the House , addresses the three the problems outlined by the April 2003 GAO report. First, the legislation authorizes $600 million in annual funding for the EPA's Great Lakes National Program Office to provide grants to the Great Lakes states, municipalities and other applicants based on the

recommendations and priorities from the region through an Advisory Board. These grants will represent the partnership between the federal government and the states and require a 20% nonfederal cost-share funding commitment from the region. The Great Lakes governors, who have been working on establishing restoration priorities for the lakes, will lead this advisory board. I also want to clarify that these funds are meant to augment the existing federal efforts of the many agencies working in the Great Lakes. These grants cannot take the place of the other programs that Congress put in place over the years.

Second, this legislation establishes a Great Lakes Federal Coordinating Council in order to ensure that federal activities in the Great Lakes are coordinated, effective, complementary, and cost-efficient.

Third, this bill gives the Great Lakes National Program Office the mandate to work with other federal agencies and Canada to identify and measure water quality and other environmental factors on a regular basis. Those measurements will help us make decisions on how to steer future restoration efforts.

Mr. Chairman, the Great Lakes are a unique treasure to the people of our region and all Americans, and we are temporary stewards. If you stood on the moon, you could actually see the lakes and recognize the "mitten" of Michigan bounded by lakes Michigan, Huron and Erie. Spread evenly across the contiguous 48 states, the lakes' water would be about 9.5 feet deep. The 179 species of fish found in the waters of the Great Lakes represent most of the important fresh water fish in North America. There are approximately 220 kinds of birds and 78 kinds of mammals in the Great Lakes basin. Endangered bird species in the basin include the American peregrine falcon, Kirtland warbler, the bald eagle and piping plover. Roughly one-tenth of the U.S. population lives in the Great Lakes basin and depend on the lakes for their water supply, tourism, recreation, and industry. I believe that we must ensure that the federal government meets its ongoing obligation to protect and restore the Great Lakes. We are only temporary stewards of the lakes. If Congress does not act in order to keep pace with the needs of the lakes, the problems will only continue to build, and we may start to undo some of the work that has already been done.

Thank you.

United States General Accounting Office

GAO

Testimony

Before the Subcommittee on Oversight of Government Management, the Federal Workforce and the District of Columbia, Committee on Governmental Affairs, U.S. Senate

For Release on Delivery
Expected at 10:00 a.m. EDT
Wednesday, July 16, 2003

GREAT LAKES

A Coordinated Strategic Plan and Monitoring System Are Needed to Achieve Restoration Goals

Statement of John B. Stephenson, Director
Natural Resources and Environment

GAO-03-999T

July 16, 2003

GAO
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Highlights

Highlights of GAO-03-999T, a report to the Subcommittee on Oversight of Government Management, the Federal Workforce and the District of Columbia, Senate Committee on Governmental Affairs

GREAT LAKES

A Coordinated Strategic Plan and Monitoring System Are Needed to Achieve Restoration Goals

Why GAO Did This Study

The five Great Lakes, which comprise the largest system of freshwater in the world, are threatened on many environmental fronts. To address the extent of progress made in restoring the Great Lakes Basin, which includes the lakes and surrounding area, GAO (1) identified the federal and state environmental programs operating in the basin and the funding devoted to them, (2) evaluated the restoration strategies used and how they are coordinated, and (3) assessed overall environmental progress made in the basin restoration effort.

What GAO Recommends

GAO recommended in its April 2003 report that the Administrator, Environmental Protection Agency (EPA)

- ensure that the Great Lakes National Program Office fulfills its coordination responsibilities and develop an overarching Great Lakes strategy; and
- develop environmental indicators and a monitoring system for the Great Lakes Basin that can be used to measure overall restoration progress.

EPA generally agreed with GAO's conclusions that better planning, coordination, monitoring and the development of indicators are needed, and stated it would provide the Congress, GAO, and the Office of Management and Budget with a formal response to the report recommendations at a later date.

www.gao.gov/cgi-bin/getrpt? GAO-03-999T.

To view the full report, including the scope and methodology, click on the link above. For more information, contact John Stephenson at (202) 512-3841 or John Wanska at (312) 220-7628.

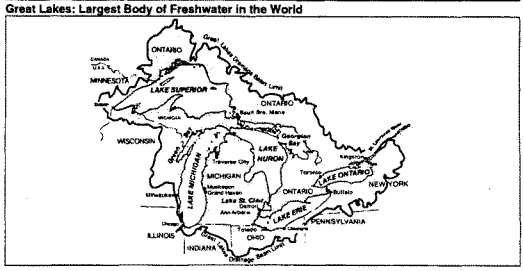
What GAO Found

There are 148 federal and 51 state programs funding environmental restoration activities in the Great Lakes Basin. Most of these programs are nationwide or statewide programs that do not specifically focus on the Great Lakes. However, several programs specifically address environmental conditions in the Great Lakes. GAO identified 33 federal Great Lakes specific programs, and states funded 17 additional unique Great Lakes specific programs. Although Great Lakes funding is not routinely tracked for many of these programs, we identified a total of about $3.7 billion in basin-specific projects for fiscal years 1992 through 2001.

GAO identified several Great Lakes environmental strategies being used at the binational, federal, and state levels. These strategies are not coordinated or unified in a fashion comparable to other large restoration projects, such as the South Florida ecosystem. Without an overarching plan for these strategies, it is difficult to determine overall progress. The Clean Water Quality Act of 1987 charged EPA's Great lakes National Program Office with the responsibility for coordinating federal actions for improving the Great Lakes' water quality, however, it has not fully exercised this authority to this point.

With available information, it is not possible to comprehensively assess restoration progress in the Great Lakes. Current indicators rely on limited quantitative data and subjective judgments to determine whether conditions are improving, such as whether fish are safe to eat. The ultimate success of an ongoing binational effort to develop a set of overall indicators for the Great Lakes is uncertain because it relies on the resources voluntarily provided by several organizations. Further, no date for completing a final list of indicators has been established.

Great Lakes: Largest Body of Freshwater in the World



Sources: National Oceanic and Atmospheric Administration and GAO.

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss our work on environmental restoration activities in the Great Lakes Basin. As you know, the Great Lakes represent the largest system of freshwater in the world and a natural resource that is threatened on many environmental fronts. To protect this resource and to address common water quality problems, the United States and Canada entered into the bilateral Great Lakes Water Quality Agreement (GLWQA) in 1972. However, today, more than three decades after the original agreement was signed, beaches are frequently closed to swimmers due to pollution, fish are unsafe for high risk individuals to eat, and raw sewage is still being dumped into the lakes.

Progress has been made on a number of significant fronts, including controlling the nonnative sea lamprey, reducing the water's phosphorus content, and improving fish populations, but much more remains to be accomplished before the overall goals of the agreement can be met. Several recently released reports, including ours, have questioned whether the current environmental activities in the Great Lakes being funded by numerous organizations and various programs have resulted in significant restoration progress in the basin, or even whether they are adequate to fulfill the United States commitments under the agreement. In 2002, we reported that the Environmental Protection Agency (EPA) needed to take action to improve its oversight for cleaning up specifically designated contaminated areas.[1]

My testimony today is based on our April 2003 report, which was prepared at the request of 14 members of Congress' Great Lakes Task Force. Specifically, GAO was asked to (1) identify the federal and state environmental programs operating in the Great Lakes Basin and the funding being devoted to them, (2) evaluate how the restoration strategies are used and coordinated, and (3) assess overall environmental progress made in the basin restoration efforts thus far.

In summary, Mr. Chairman, we found the following:

[1]See U.S. General Accounting Office, *Great Lakes: EPA Needs to Define Organizational Responsibilities Better for Effective Oversight and Cleanup of Contaminated Areas*, GAO-02-563 (Washington, D.C.: May 17, 2002).

- There are 148 federal and 51 state programs funding environmental restoration activities in the Great Lakes Basin. Most of these are nationwide or statewide programs that do not specifically focus on the Great Lakes, but do fund projects that help clean up the basin. We could not determine the total Great Lakes specific funding contributions from these programs, because funds are not typically tracked for specific areas such as the basin. However, based on partial information available from 11 federal agencies and 7 of the 8 Great Lakes states, we determined that at least $1.8 billion in federal funding and $461.3 million in state funding went to basin-related projects in fiscal years 1992 through 2001. In addition, there were 33 federal programs focused specifically on the Great Lakes Basin, for which about $387 million was spent in fiscal years 1992 through 2001, and the states funded 17 additional Great Lakes specific programs, for which about $956 million was expended during the same general time period.

- The numerous restoration programs operating in the Great Lakes Basin employ a variety of environmental strategies at the binational, federal, and state levels to address specific environmental problems, but there is no overarching plan for coordinating these disparate strategies and program activities into a coherent approach for attaining overall basin restoration goals. Without such a plan for the basin, it is difficult to determine overall progress and ensure that limited resources are being used effectively. Other large-scale ecosystem restoration efforts, such as those for the Chesapeake Bay and the South Florida ecosystem, have demonstrated the importance of having a comprehensive strategic plan with clearly articulated goals, objectives, and criteria for measuring success and a decision-making body for weighing the merits of, and prioritizing funding for, proposed cleanup and restoration projects.

- The absence of a unified Great Lakes restoration effort stems, in part, from the lack of an effective, authoritative organizational entity for planning, monitoring, and establishing funding priorities. The Clean Water Quality Act of 1987 charged EPA's Great Lakes National Program Office (GLNPO) with the responsibility for coordinating federal actions for improving the Great Lakes' water quality. However, GLNPO has not fully exercised this authority. For example, it has not entered into agreements with other agency organizations regarding their restoration responsibilities, as required by the Clean Water Act.

- Additionally, the lack of consistent, reliable information and measurement indicators makes it impossible to comprehensively assess restoration progress in the Great Lakes Basin. While the Great Lakes Water Quality Agreement long ago called for the development and implementation of a

monitoring system, this requirement has not yet been met. Furthermore, any effort to develop indicators must rely on limited quantitative data and subjective judgments to determine whether conditions are improving. In 1996, a binational effort was initiated to develop a set of overall indicators for the Great Lakes through a series of biennial conferences, but the ultimate success of this effort, which relies on the volunteer contributions of several organizations, is uncertain at best.

To improve coordination and help ensure that funds are spent effectively, we recommended that the Administrator, Environmental Protection Agency, (1) charge GLNPO with the responsibility for developing an overarching Great Lakes strategy with specific goals and priorities for evaluating and funding alternative projects, (2) submit a proposal to Congress for funding the plan, and (3) develop environmental indicators and a monitoring system that can be used to measure overall restoration progress. EPA generally agreed with our conclusions but stated that it would provide a formal response to our recommendations at a later date.

Background

The Great Lakes Basin is a large area that extends well beyond the five lakes proper to include their watersheds, tributaries, connecting channels, and a portion of the St. Lawrence River. The basin encompasses nearly all of the state of Michigan and parts of Illinois, Indiana, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and the Canadian province of Ontario. The lakes form the largest freshwater system on earth, accounting for 20 percent of the world's fresh surface water and over 95 percent of the U.S. fresh surface water supply for the contiguous 48 states.

Millions of people in the United States and Canada rely on the five Great Lakes—Superior, Michigan, Erie, Huron, and Ontario—as a principal source of their drinking water, recreation, and economic livelihood. Over time, industrial, agricultural, and residential development on lands adjacent to the lakes has seriously degraded the lakes' water quality, posing threats to human health and the environment, and forcing restrictions on activities such as swimming and fish consumption.

To protect the Great Lakes Basin and to address water quality problems, the governments of the United States and Canada entered into the bilateral Great Lakes Water Quality Agreement in 1972. In the agreement, the United States and Canada agreed to restore and maintain the chemical, physical, and biological integrity of the Great Lakes Basin. A new agreement with the same name was reached in 1978 and amended in 1983 and 1987. The agreement prescribes prevention and cleanup measures to

improve environmental conditions in the Great Lakes. The agreement obligates the International Joint Commission (IJC), an international body, to assist in and report on the implementation of the agreement.

The Clean Water Act directs EPA to lead efforts to meet the goals of the Great Lakes Water Quality Agreement and establishes GLNPO within EPA, charging it with, among other things, cooperating with federal, state, tribal, and international agencies to develop action plans to carry out the responsibilities of the U.S. under the agreement. GLNPO is further responsible for coordinating the agency's actions both in headquarters and in the regions to improve Great Lakes' water quality. In addition to GLNPO, numerous federal, state, binational, and nonprofit organizations conduct activities that focus on improving the overall Great Lakes Basin environment or some specific environmental issue within the basin.

Many Federal and State Programs Fund Restoration Activities in the Great Lakes Basin

About 200 programs—148 federal and 51 state—fund restoration activities within the Great Lakes Basin. Most of these programs, however, involve the localized application of national or state environmental initiatives and do not specifically focus on basin concerns. Officials from 11 federal agencies identified 115 of these broadly scoped federal programs, and officials from seven of the eight Great Lakes states identified 34 similar state programs. EPA administers the majority of the federal programs that provide a broad range of environmental activities involving research, cleanup, restoration, and pollution prevention. For example, EPA's nationwide Superfund program funds cleanup activities at contaminated areas throughout the basin. While these broadly scoped federal and state programs contribute to basin restoration, program officials do not track or try to isolate the portion of funding directed toward specific areas, such as the basin, which makes it difficult to determine their contributions to total Great Lakes spending. However, basin-specific information was available on some of these programs. Specifically, basin-related expenditures for 53 of the 115 broadly scoped federal programs totaled about $1.8 billion in fiscal years 1992 through 2001. Expenditures for 14 broadly scoped state-funded programs totaled $461.3 million during approximately the same time period.

Several federal and state programs were specifically designed to focus on environmental conditions across the Great Lakes Basin. Officials from seven federal agencies identified 33 Great Lakes specific programs that had expenditures of $387 million in fiscal years 1992 through 2001. Most of these programs funded a variety of activities, such as research, cleanup, or pollution prevention. An additional $358 million was expended for

legislatively directed Corps of Engineers projects in the basin, such as a $93.8 million project to restore Chicago's shoreline. Officials from seven states reported 17 Great Lakes specific programs that expended about $956 million in 1992 through 2001, with Michigan's programs accounting for 96 percent of this amount. State programs focused on unique state needs, such as Ohio's program to control shoreline erosion along Lake Erie and Michigan's program to provide bond funding for environmental activities.

Besides federal and state government agencies, other organizations, such as foundations, fund a variety of restoration activities in the Great Lakes Basin by approving grants to nonprofit and other organizations. Other governmental and nongovernmental organizations fund restoration activities. For example, individual municipalities, township governments, counties, and conservation districts are involved in various restoration activities.

The Lack of a Coordinated, Overarching Strategic Plan Has Impeded Restoration Efforts

Restoration of the Great Lakes Basin is a major endeavor involving many environmental programs and organizations. The magnitude of the area comprising the basin and the numerous environmental programs operating within it require the development of one overarching strategy to address and manage the complexities of restoring the basin's environmental health. The Great Lakes region cannot hope to successfully receive support as a national priority without a comprehensive plan for restoring the Great Lakes. In lieu of such a plan, organizations at the binational, federal, and state levels have developed their own strategies for the Great Lakes, which have inadvertently made the coordination of the various programs operating in the basin more challenging.

The Great Lakes Basin needs a comprehensive strategy or plan similar to the plans developed for other large ecosystem restoration efforts, such as those for the South Florida ecosystem and the Chesapeake Bay. In South Florida, federal, state, local and tribal organizations joined forces to participate on a centralized task force formalized in the Water Resource Development Act of 1996. The strategic plan developed for the South Florida ecosystem by the task force made substantial progress in guiding the restoration activities. The plan identifies the resources needed to achieve restoration and assigns accountability for specific actions for the extensive restoration effort, estimated to cost $14.8 billion. The Chesapeake Bay watershed also has an overarching restoration strategy stemming from a 1983 agreement signed by Maryland, Virginia, and Pennsylvania; the District of Columbia; the Chesapeake Bay Commission;

and EPA. The implementation of this strategy has resulted in improvements in habitat restoration and aquatic life, such as increases in bay grasses and in the shad population.

Several organizations have developed strategies for the basin at the binational, federal, or state levels that address either the entire basin or the specific problems in the Great Lakes. EPA's Great Lakes Strategy 2002, developed by a committee of federal and state officials, is the most recent of these strategies. While this strategy identified restoration objectives and planned actions by various federal and state agencies, it is largely a description of existing program activity relating to basin restoration. State officials told us that the states had already planned the actions described in it, but that these actions were contingent on funding for specific environmental programs. The strategy included a statement that it should not be construed as a commitment for additional funding or resources, and it did not provide a basis for prioritizing activities. In addition, we identified other strategies that addressed particular contaminants, the restoration of individual lakes, or the cleanup of contaminated areas. Ad hoc coordination takes place among federal agencies, states, and other environmental organizations in developing these strategies or when programmatic activity calls for coordination.

Other Great Lakes strategies address unique environmental problems or specific geographical areas. For example, a strategy for each lake addresses the open lake waters through Lakewide Management Plans (LaMP), which EPA is responsible for developing. Toward this end, EPA formed working groups for each lake to identify and address restoration activities. For example, the LaMP for Lake Michigan, issued in 2002, includes a summary of the lake's ecosystem status and addresses progress in achieving the goals described in the previous plan, with examples of significant activities completed and other relevant topics. However, EPA has not used the LaMPs to assess the overall health of the ecosystem.

The Binational Executive Committee for the United States and Canada issued its Great Lakes Binational Toxics Strategy in 1997 that established a collaborative process by which EPA and Environment Canada, in consultation with other federal departments and agencies, states, tribes and the province of Ontario work toward the virtual elimination of persistent toxic substances in the Great Lakes. The strategy was designed to address particular substances that bioaccumulate in fish or animals and pose a human health risk.

Michigan developed a strategy for environmental cleanup called the Clean Michigan Initiative. This initiative provides funding for a variety of environmental, parks, and redevelopment programs. It includes nine components, including Brownfields redevelopment and environmental cleanups, nonpoint source pollution control, clean water, cleanup of contaminated sediments, and pollution prevention. The initiative is funded by a $675 million general obligation bond and, as of early 2003, most of the funds had not been distributed.

Although there are many strategies and coordination efforts ongoing, no one organization coordinates restoration efforts. We found that extensive strategizing, planning, and coordinating have not resulted in significant restoration. Thus, the ecosystem remains compromised and contaminated sediments in the lakes produce health problems, as reported by the IJC.[2]

In addition to the absence of a coordinating agency, federal and state officials cited a lack of funding commitments as a principal barrier that impedes restoration progress. Inadequate funding has also contributed to the failure to restore and protect the Great Lakes, according to the IJC biennial report on Great Lakes water quality issued in July 2000.[3] The IJC restated this position in a 2002 report, concluding that any progress to restore the Great Lakes would continue at a slow incremental pace without increased funding.[4] In its 1993 biennial report, the IJC concluded that remediation of contaminated areas could not be accomplished unless government officials came to grips with the magnitude of cleanup costs and started the process of securing the necessary resources.[5] Despite this warning, however, as we reported in 2002, EPA reduced the funding available for ensuring the cleanup of contaminated areas under the assumption that the states would fill the funding void. States, however, did not increase their funding, and restoration progress slowed or stopped altogether.[6] Officials for 24 of 33 federal programs and for 3 of 17 state programs reported insufficient funding for federal and state Great Lakes specific programs.

[2]See IJC, *Tenth Biennial Report on Great Lakes Water Quality* (June 29, 2000).

[3]See IJC *Tenth Biennial Report on Great Lakes Water Quality* (June 29, 2000).

[4]See IJC, *Eleventh Biennial Report on Great Lakes Water Quality* (Sept. 12, 2002).

[5]See IJC, *Seventh Biennial Report on Great Lakes Water Quality* (Dec. 15, 1993).

[6]See GAO-02-563.

The ultimate responsibility for coordinating Great Lakes restoration programs rests with GLNPO; however, GLNPO has not fully exercised this authority. Other organizations or committees have been formed to assume coordination and strategy development roles. The Clean Water Act provides GLNPO with the authority to fulfill the responsibilities of the U.S. under the GLWQA. Specifically, the act directs EPA to coordinate the actions of EPA's headquarters and regional offices aimed at improving Great Lakes water quality. It also provides GLNPO authority to coordinate EPA's actions with the actions of other federal agencies and state and local authorities for obtaining input in developing water quality strategies and obtaining support in achieving the objectives of the GLWQA. The act also provides that the EPA Administrator shall ensure that GLNPO enters into agreements with the various organizational elements of the agency engaged in Great Lakes activities and with appropriate state agencies. The agreements should specifically delineate the duties and responsibilities, time periods for carrying out duties, and resources committed to these duties. GLNPO officials stated that they do not enter into formal agreements with other EPA offices but rather fulfill their responsibilities under the act by having federal agencies and state officials agree to the restoration activities contained in the Great Lakes Strategy 2002. However, the strategy does not represent formal agreements to conduct specific duties and responsibilities with committed resources. EPA's Office of Inspector General reported the absence of these agreements in September 1999.[7] The report stated that GLNPO did not have agreements as required by the act and recommended that such agreements be made to improve working relationships and coordination.

To improve coordination of Great Lakes activities and ensure that federal dollars are effectively spent, we recommended that the Administrator, EPA, ensure that GLNPO fulfills its responsibility for coordinating programs within the Great Lakes Basin; charge GLNPO with developing, in consultation with the governors of the Great Lakes states, federal agencies, and other organizations, an overarching strategy that clearly defines the roles and responsibilities for coordinating and prioritizing funding for projects; and submit a time-phased funding requirement proposal to the Congress necessary to implement the strategy.

[7]See U.S. Environmental Protection Agency, *EPA's Great Lakes Program*, EPA/OIG Rept. 99P00212 (Washington, D.C.: Sept. 1, 1999).

The Lack of an Effective Monitoring System Makes it Impossible to Assess Overall Restoration Progress

The Great Lakes Water Quality Agreement, as amended in 1987, calls for establishing a monitoring system to measure restoration progress and assess the degree to which the United States and Canada are complying with the goals and objectives of the agreement. However, implementation of this provision has not progressed to the point that overall restoration progress can be measured or determined based on quantitative information. Recent assessments of overall progress, which rely on a mix of quantitative data and subjective judgments, do not provide an adequate basis for making an overall assessment. The current assessment process has emerged from a series of biennial State of the Lakes Ecosystem Conferences (SOLEC)[8] initiated in 1994 for developing indicators agreed upon by conference participants.

Prior to the 1987 amendments to the GLWQA, the 1978 agreement between the two countries also contained a requirement for surveillance and monitoring and for the development of a Great Lakes International Surveillance Plan. The IJC Water Quality Board was involved in managing and developing the program until the 1987 amendments gave this responsibility to the United States and Canada. This change resulted in a significant reduction in the two countries' support for surveillance and monitoring. In fact, the organizational structure to implement the surveillance plan was abandoned in 1990, leaving only one initiative in place—the International Atmospheric Deposition Network (IADN), which involved a network of 15 air-monitoring stations located throughout the basin.

With the surveillance and monitoring efforts languishing, IJC established the Indicators for Evaluation Task Force in 1993 to identify the appropriate framework to evaluate progress in the Great Lakes. In 1996, the task force proposed that nine desired measurements and outcomes be used to develop indicators for measuring progress in the Great Lakes.

Shortly before the task force began its work, the United States and Canada had agreed to hold conferences every 2 years to assess the environmental conditions in the Great Lakes in order to develop binational reports on environmental conditions to measure progress under the agreement. Besides assessing environmental conditions, the conferences were focused on achieving three other objectives, including providing a forum for communication and networking among stakeholders. Conference

[8]SOLEC is co-chaired by representatives from the U.S. EPA and Environment Canada.

participants included U.S. and Canadian representatives from federal, state, provincial, and tribal agencies, as well as from other organizations with environmental restoration or pollution prevention interests in the Great Lakes Basin. The 1994 SOLEC conference culminated in a "State of the Great Lakes 1995" report, which provided an overview of the Great Lakes ecosystem at the end of 1994 and concluded that overall the aquatic community health was mixed or improving. This same assessment was echoed in the 1997 state of the lakes report. Meanwhile the IJC agreed that the nine desired outcome areas recommended by the task force would help assess overall progress. It recommended that SOLEC, during the conference in 2000, establish environmental indicators that would allow the IJC to evaluate what had been accomplished and what needed to be done for three of the nine indicators—the public's ability to eat the fish, drink the water, and swim in the water without any restrictions.

However, the indicators developed through the SOLEC process and the accomplishments reported by federal and state program managers do not provide an adequate basis for making an overall assessment for Great Lakes restoration progress. The SOLEC process is ongoing, and the indicators that are still being developed are not generally supported by sufficient underlying data for making progress assessments. The number of indicators considered during the SOLEC conferences has been pared down from more than 850 indicators in 1998 to 80 indicators in 2000, although data was available for only 33 of them.

After the SOLEC 2000 conference, IJC staff assessed the indicators supported by data that measured the desired outcomes of swimmability, drinkability, and the edibility of fish in the Great Lakes.[9] Overall, the IJC commended SOLEC's quick response that brought together information regarding the outcomes and SOLEC's ongoing efforts. The IJC, however, recognized that sufficient data were not being collected throughout the Great Lakes Basin and that the methods of collection, the data collection time frames, the lack of uniform protocols, and the incompatible nature of some data jeopardized their use as indicators. Specifically, for the desired outcome of swimmability, the IJC concurred that it was not always safe to swim at certain beaches but noted that progress for this desired outcome was limited because beaches were sampled by local jurisdictions without uniform sampling or reporting methods. At the 2002 SOLEC conference, the number of indicators assessed by conference participants increased

[9]See IJC, *Eleventh Biennial Report on Great Lakes Water Quality* (Sept. 12, 2002).

from 33 to 45. The IJC expressed concern that there are too many indicators, insufficient supporting backup data, and a lack of commitment and funding from EPA to implement and make operational the agreed upon SOLEC baseline data collection and monitoring techniques. The IJC recommended in its last biennial report that any new indicators should be developed only where resources are sufficient to access scientifically valid and reliable information.

The ultimate successful development and assessment of indicators for the Great Lakes through the SOLEC process are uncertain because insufficient resources have been committed to the process, no plan provides completion dates for indicator development and implementation, and no entity is coordinating the data collection. Even though the SOLEC process has successfully engaged a wide range of binational parties in developing indicators, the resources devoted to this process are largely provided on a voluntary basis without firm commitments to continue in the future. GLNPO officials described the SOLEC process as a professional, collaborative process dependent on the voluntary participation of officials from federal and state agencies, academic institutions, and other organizations attending SOLEC and developing information on specific indicators. Because SOLEC is a voluntary process, the indicator data resides in a diverse number of sources with limited control by SOLEC organizers. GLNPO officials stated that EPA has neither the authority nor the responsibility to direct the data collection activities of federal, state, and local agencies as they relate to the surveillance and monitoring of technical data elements that are needed to develop, implement, and assess Great Lakes environmental indicators. Efforts are underway for the various federal and state agencies to take ownership for collecting and reporting data outputs from their respective areas of responsibility and for SOLEC to be sustained and implemented; each indicator must have a sponsor. However, any breakdown in submitting this information would leave a gap in the SOLEC indicator process.

EPA supports the development of environmental indicators as evidenced by the fact that, since 1994, GLNPO has provided about $100,000 annually to sponsor the SOLEC conferences. Additionally, GLNPO spends over $4 million per year to collect surveillance data for its open-lake water quality monitoring program, which also provides supporting data for some of the indicators addressed by SOLEC. A significant portion of these funds, however, supports the operation of GLNPO's research vessel, the Lake Guardian, an offshore supply vessel converted for use as a research vessel. GLNPO also supports activities that are linked or otherwise feed information into the SOLEC process, including the following:

- collecting information on plankton and benthic communities in the Great Lakes for open water indicator development;
- sampling various chemicals in the open-lake waters, such as phosphorus for the total phosphorus indicator;
- monitoring fish contaminants in the open waters, directly supporting the indicator for contaminants in whole fish and a separate monitoring effort for contaminants in popular sport fish species that supports the indicator for chemical contaminants in edible fish tissue; and
- operating 15 air-monitoring stations with Environment Canada comprising the IADN that provides information for establishing trends in concentrations of certain chemicals and loadings of chemicals into the lakes. EPA uses information from the network to take actions to control the chemicals and track progress toward environmental goals.

In November 2001, EPA committed to an agencywide initiative to develop environmental indicators for addressing the agency's nationwide environmental conditions, stating that "indicators help measure the state of our air, water and land resources and the pressures placed on them, and the resulting effects on ecological and human health." However, this initiative does not specifically relate to the Great Lakes. The short-term goal for this initiative is to develop information that will indicate current nationwide environmental conditions and to help EPA make sound decisions on what needs to be done. The long-term goal is to bring together national, regional, state, and tribal indicator efforts to describe the condition of critical environmental areas and human health concerns.

Program officials frequently cite output data as measures of success rather than actual program accomplishments in improving environmental conditions in the basin. As a rule, program output data describe activities, such as projects funded, and are of limited value in determining environmental progress. For example, in reporting the accomplishments for Michigan's Great Lakes Protection Fund, officials noted that the program had funded 125 research projects over an 11-year period and publicized its project results at an annual forum and on a Web site. Similarly, the Lake Ontario Atlantic Salmon Reintroduction Program administered by the U.S. Department of the Interior's Fish and Wildlife Service listed under its accomplishments the completion of a pilot study and technical assistance provided to a Native American tribe.

Of the 50 federal and state programs created specifically to address conditions in the basin, 27 reported accomplishments in terms of outputs, such as reports or studies prepared or presentations made to groups. Because research and capacity building programs largely support other activities, it is particularly difficult to relate reported program accomplishments to outcomes. The federal and state environmental program officials who responded to our evaluation generally provided output data or, as reported for 15 programs, reported that the accomplishments had not been measured for the programs.

Only eight of the federal or state Great Lakes specific programs reported outcome information, much of which generally described how effective the programs' activities or actions had been in improving environmental conditions. For example, EPA's Region II program for reducing toxic chemical inputs into the Niagara River, which connects Lake Erie to Lake Ontario, reported reductions in priority toxics from 1986 through 2002 from ambient water quality monitoring. Other significant outcomes reported as accomplishments for the Great Lakes included (1) reducing phosphorus loadings by waste treatment plants and limiting phosphorus use in household detergents; (2) prohibiting the release of some toxicants into the Great Lakes, and reducing to an acceptable level the amount of some other toxicants that could be input; (3) effectively reducing the sea lamprey population in several invasive species-infested watersheds; and (4) restocking the fish-depleted populations in some watersheds.

To fulfill the need for a monitoring system called for in the GLWQA and to ensure that the limited funds available are optimally spent, we recommended that the Administrator, EPA, in coordination with Canadian officials and as part of an overarching Great Lakes strategy, (1) develop environmental indicators and a monitoring system for the Great Lakes Basin that can be used to measure overall restoration progress and (2) require that these indicators be used to evaluate, prioritize, and make funding decisions on the merits of alternative restoration projects.

Mr. Chairman, this completes my prepared statement. I would be happy to answer any questions that you or other members of the Subcommittee may have at this time.

United States General Accounting Office

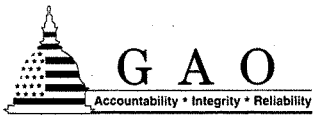
GAO

Report to Congressional Requesters

April 2003

GREAT LAKES

An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals



GAO-03-515

April 2003

GAO
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Highlights

Highlights of GAO-03-515, a report to congressional requesters

GREAT LAKES

An Overall Strategy and Indicators for Measuring Progress Are Needed To Better Achieve Restoration Goals

Why GAO Did This Study

The five Great Lakes, which comprise the largest system of freshwater in the world, are threatened on many environmental fronts. To address the extent of progress made in restoring the Great Lakes Basin, which includes the lakes and surrounding area, GAO (1) identified the federal and state environmental programs operating in the basin and funding devoted to them, (2) evaluated the restoration strategies used and how they are coordinated, and (3) assessed overall environmental progress made in the basin restoration effort.

What GAO Recommends

GAO recommends that the Administrator, Environmental Protection Agency

- ensure that the Great Lakes National Program Office fulfills its coordination responsibilities and develop an overarching Great Lakes strategy; and
- develop environmental indicators and a monitoring system for the Great Lakes Basin that can be used to measure overall restoration progress.

EPA generally agreed with GAO's conclusions that better planning, coordination, monitoring and the development of indicators are needed, and stated it would provide the Congress, GAO, and the Office of Management and Budget with a formal response to the report recommendations at a later date.

www.gao.gov/cgi-bin/getrpt?GAO-03-515.

To view the full report, including the scope and methodology, click on the link above. For more information, contact John Stephenson at (202) 512-3841, or John Wanska at (312) 220-7628.

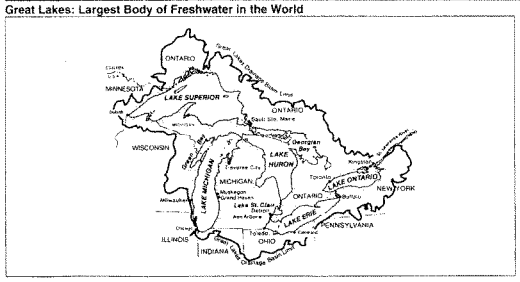
What GAO Found

There are 148 federal and 51 state programs funding environmental restoration activities in the Great Lakes Basin. Most of these programs involve the localized application of national or state environmental initiatives and do not specifically focus on unique basin concerns. However, several programs specifically address environmental conditions in the Great Lakes. GAO identified 33 federal Great Lakes specific programs, and states funded 17 additional unique Great Lakes specific programs. Other governmental, binational, and nongovernmental organizations also fund restoration activities within the basin.

GAO identified several Great Lakes environmental strategies being used at the binational, federal, and state levels. These strategies are not coordinated or unified in a fashion comparable to other large restoration projects such as the South Florida Ecosystem. In an effort to improve coordination, federal and state officials recently published *Great Lakes Strategy 2002*, but this document is largely a description of existing and planned program activities rather than an overarching plan. EPA's Great Lakes National Program Office has coordination authority over many activities but has not fully exercised it to this point.

With available information, it is not possible to comprehensively assess restoration progress in the Great Lakes. Current indicators rely on limited quantitative data and subjective judgments to determine whether conditions are improving, such as whether fish are safe to eat. The ultimate success of an ongoing binational effort to develop a set of overall indicators for the Great Lakes is uncertain because it relies on the resources voluntarily provided by several organizations. Further, no date for completing a final list of indicators has been established.

Great Lakes: Largest Body of Freshwater in the World



Sources: National Oceanic and Atmospheric Administration and GAO.

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Abbreviations

AOCs	Areas of concern
ATSDR	Agency for Toxic Substances and Disease Registry
CERP	Comprehensive Everglades Restoration Plan
Corps	Army Corps of Engineers
EPA	Environmental Protection Agency
FSA	Farm Services Agency
FWS	Fish and Wildlife Service
GLNPO	Great Lakes National Program Office
GLWQA	Great Lakes Water Quality Agreement
IADN	International Atmospheric Deposition Network
IJC	International Joint Commission
LaMPs	Lakewide Management Plans
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	National Resource Conservation Service
OAR	Office of Air and Radiation
ORD	Office of Research and Development
OSWER	Office of Solid Waste and Emergency Response
RAPs	Remedial Action Plans
RCRA	Resource Conservation and Recovery Act
SOLEC	State of the Lakes Ecosystem Conference
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USPC	United States Policy Committee
WRDA	Water Resources Development Act

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United States General Accounting Office
Washington, DC 20548

April 30, 2003

Congressional Requesters

As requested, we are reporting to you on the federal and state environmental programs operating in the Great Lakes Basin. This report contains recommendations to the Environmental Protection Agency (EPA) on the need to develop a comprehensive strategic plan for basin restoration, coordinate the multiple restoration activities in the basin, and facilitate the expeditious development of environmental indicators for measuring restoration progress.

As arranged with your offices, we plan no further distribution of this report until 30 days after the date of this letter unless you publicly announce its contents earlier. We will then send copies to appropriate congressional committees; the Administrator, EPA; various other federal departments and agencies; and the International Joint Commission. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://gao.gov.

Should you or your staff need further information, please contact me on (202) 512-3841. Key contributors to this report are listed in appendix VI.

John B. Stephenson
Director, Natural Resources
and Environment

List of Congressional Requesters

The Honorable Evan Bayh
United States Senate

The Honorable Mike DeWine
United States Senate

The Honorable Carl Levin
United States Senate

The Honorable Debbie Stabenow
United States Senate

The Honorable Sherwood Boehlert
House of Representatives

The Honorable Sherrod Brown
House of Representatives

The Honorable John Dingell
House of Representatives

The Honorable Vernon Ehlers
House of Representatives

The Honorable Marcy Kaptur
House of Representatives

The Honorable Steven LaTourette
House of Representatives

The Honorable James Oberstar
House of Representatives

The Honorable Louise Slaughter
House of Representatives

The Honorable Bart Stupak
House of Representatives

Executive Summary

Purpose

The United States and Canada recognize the Great Lakes—the largest system of freshwater in the world—as a natural resource that is threatened on many environmental fronts. To protect this resource and to address common water quality problems, the two countries entered into the bilateral Great LakesWater Quality Agreement in 1972 and last revised it in 1987. However, three decades after the original agreement, polluted beaches are frequently closed to swimmers, fish are unsafe to eat for high risk individuals, and raw sewage is still being dumped into the lakes. Progress has been made on a number of significant fronts, such as controlling the nonnative sea lamprey, reducing the water's phosphorus content, and improving fish populations, but much more remains to be accomplished before the overall goals of the agreement can be met. Several recently released reports have questioned whether the current environmental activities in the Great Lakes being funded by numerous organizations and various programs are adequate to fulfill the U.S. commitments and whether restoration progress is sufficient in the basin. In 2002, GAO reported that the Environmental Protection Agency (EPA) needed to take action to improve its oversight for cleaning up contaminated areas.

To address the progress of restoration, 14 members of Congress participating on the Great Lakes Task Force asked GAO to (1) identify the federal and state environmental programs operating in the Great Lakes Basin and the funding being devoted to them, (2) evaluate how the restoration strategies are used and coordinated, and (3) assess overall environmental progress made in the basin restoration effort thus far.

Background

Millions of people in the United States and Canada rely on the five Great Lakes—Superior, Michigan, Erie, Huron, and Ontario—as a principal source of drinking water, recreation, and economic livelihood. Over time, industrial, agricultural, and residential development on lands adjacent to the lakes has seriously degraded the lakes' water quality, posing threats to human health and the environment, and forcing restrictions on activities, such as swimming and fish consumption.

To protect the Great Lakes Basin, and to address water quality problems, the governments of the United States and Canada entered into the bilateral Great Lakes Water Quality Agreement in 1972. In the agreement, the United States and Canada agreed to restore and maintain the chemical, physical, and biological integrity of the Great Lakes Basin. A new agreement with the same name was reached in 1978. The agreement was amended in 1983 and 1987, expanding the scope of activities by

prescribing prevention and cleanup measures to improve environmental conditions in the Great Lakes. The agreement obligates the International Joint Commission (IJC), an international body, to assist in the implementation of the agreement.

The Clean Water Act directs EPA to lead efforts to meet the goals of the Great Lakes Water Quality Agreement and establishes the Great Lakes National Program Office (GLNPO) within EPA, charging it with, among other things, cooperating with federal, state, tribal, and international agencies to develop action plans to carry out the U.S. responsibilities under the agreement. GLNPO is further responsible for coordinating the agency's actions both in headquarters and in the regions to improve Great Lakes' water quality. In addition to GLNPO, numerous federal, state, binational, and nonprofit organizations conduct activities that focus on improving the overall Great Lakes Basin environment or some specific environmental issue within the basin.

Results in Brief

There are 148 federal and 51 state programs funding environmental restoration activities in the Great Lakes Basin. Most of these programs involve the localized application of national or state environmental initiatives that do not specifically focus on basin concerns. For example, EPA's Superfund program addresses some of the contaminated sites located within the basin. Superfund officials, like officials for most nationwide, as well as most statewide, programs, do not track or itemize their overall funding by region, such as isolating the portion of funding going to specific areas (e.g., the basin), making it difficult to determine their contribution to total Great Lakes spending. In addition to the nationwide federal programs, the Congress has also enacted 33 federal programs focused specifically on the Great Lakes Basin, for which about $387 million was spent in fiscal years 1992 through 2001, to specifically address environmental conditions in the Great Lakes. Additionally, the Corps of Engineers expended about $358 million during the same time period for legislatively directed projects within the basin, such as $93.8 million for restoration of Chicago's shoreline. States funded 17 additional Great Lakes specific programs, for which about $956 million was expended during the same general time period to address unique state needs, such as Ohio's program to control shoreline erosion along Lake Erie. In addition to federal and state programs, county and municipal governmental organizations, binational organizations, and nongovernmental organizations, such as nonprofit organizations, fund restoration activities within the basin.

The numerous restoration programs currently underway in the Great Lakes Basin employ a variety of environmental strategies at the binational, federal, and state levels to address specific environmental problems, but there is no overarching plan for coordinating and tying together the strategies and program activities into a coherent approach to attain overall basin restoration. Experience with other large-scale ecosystem restoration efforts, such as the South Florida ecosystem, has demonstrated the importance of having a comprehensive strategic plan with clearly articulated goals, objectives, and criteria for measuring success and a decision-making body for weighing the merits of, and prioritizing funding for, proposed cleanup and restoration projects. Without such a plan for the basin, it is difficult to determine overall progress and ensure that limited resources are being effectively utilized. Although federal and state officials recently developed and published a report, *Great Lakes Strategy 2002*, to fill this void, the document, largely a description of existing and planned program activities, did not provide a basis or mechanisms to prioritize or make funding commitments to implement the various activities. GLNPO, the office within EPA charged with fulfilling U.S. responsibilities under the agreement and for coordinating federal actions for improving Great Lakes' water quality, has not fully exercised this authority because it has not entered into agreements with other agency organizations regarding their restoration responsibilities as required by the Clean Water Act. GAO is recommending that EPA ensure that GLNPO fulfills its coordination responsibilities and, in consultation with the governors of the Great Lakes states, federal agencies, and other organizations, develop an overarching strategy that clearly defines the roles and responsibilities for coordinating and prioritizing funding for Great Lakes projects, and submit a proposal to the Congress detailing the time-phased funding requirements necessary to implement the strategy.

A comprehensive assessment of restoration progress in the Great Lakes Basin cannot be determined with the piecemeal information currently available. The Great Lakes Water Quality Agreement called for the development and implementation of a monitoring system, but this requirement has not yet been met. The environmental indicators currently being used to determine overall progress are inadequate because they rely on limited quantitative data and subjective judgments to determine whether conditions are improving. An ongoing binational effort initiated in 1996 has worked to develop a set of overall indicators for the Great Lakes through a series of biennial conferences. The ultimate success of this effort, which relies on the volunteer contributions of several organizations, is uncertain and thus far no completion date for developing a final list of indicators has been set. GAO is recommending that EPA, in coordination

with Canadian officials, develop environmental indicators and a monitoring system for the Great Lakes Basin that can be used to measure overall restoration progress and require these indicators to be used to evaluate, prioritize, and make funding decisions on the merits of alternative restoration projects.

Principal Findings

Many Federal and State Programs Fund Restoration Activities in the Great Lakes Basin

About 200 programs—148 federal and 51 state—fund restoration activities within the Great Lakes Basin. Most of these programs involve the localized application of national or state environmental initiatives and do not specifically focus on basin concerns. Officials from 11 agencies identified 115 of these broadly scoped federal programs, and officials from 7 of the 8 Great Lakes states identified 34 similar state programs. EPA administers the majority of the federal programs that provide a broad range of environmental activities involving research, cleanup, restoration, and pollution prevention. For example, EPA's nationwide Superfund program funds cleanup activities at contaminated areas throughout the basin. While the broad scoped federal and state programs contribute to basin restoration, program officials do not track or try to isolate the portion of funding going to specific areas like the basin, making it difficult to determine their contribution to total Great Lakes spending. However, GAO was able to identify basin-specific information on some of these programs. Specifically, basin related expenditures for 53 of the 115 broadly scoped federal programs totaled about $1.8 billion in fiscal years 1992 through 2001, and the expenditures for 14 statewide programs totaled $461.3 million during basically the same time period.

Several federal and state programs were specifically designed to focus on the Great Lakes Basin environmental conditions. Officials from 7 federal agencies identified 33 Great Lakes specific programs that had expenditures of $387 million in fiscal years 1992 through 2001. Most of the programs funded a variety of activities, such as research, cleanup, or pollution prevention. An additional $358 million was expended for legislatively directed Corps of Engineers projects in the basin, such as $93.8 million to restore Chicago's shoreline. Officials from 7 states reported 17 Great Lakes specific programs that expended about $956 million in 1992 through 2001, with Michigan's programs accounting for 96 percent of this amount. State programs focused on unique state needs, such as Ohio's program to control shoreline erosion along Lake Erie, and Michigan's program to provide bond funding for environmental activities.

Besides federal and state programs, county and municipal organizations, binational organizations, and nongovernmental organizations, such as nonprofit organizations, fund restoration activities within the basin.

Different Strategies, Lack of Coordination, and Limited Funding Impede Restoration Efforts

Restoration of the Great Lakes Basin is a major endeavor involving many environmental programs and organizations. The magnitude of this effort cannot succeed without a comprehensive strategy or plan similar to those developed for other large ecosystem restoration projects, such as the South Florida ecosystem and the Chesapeake Bay. Because of the many parties involved in planning, strategizing, and conducting restoration activities in the basin, an overarching strategy and a comprehensive plan are needed that clearly articulate goals, objectives, and criteria for measuring success and that establish a decision-making body to weigh the merits of, and prioritize funding for, proposed cleanup and restoration projects.

Several organizations have developed strategies for the basin at the binational, federal, and state levels that address either the entire basin or the specific problems in the Great Lakes. The *Great Lakes Strategy 2002*, developed by a committee of federal and state officials, is the most recent of these strategies. While this strategy identified restoration objectives and planned actions by various federal and state agencies, it is largely a description of existing program activity relating to basin restoration. State officials involved in developing the strategy told us that states had already planned the actions described in it, but that these actions were contingent on funding for specific environmental programs. The strategy acknowledged that it should not be construed as a commitment for additional funding or resources, and it did not provide a basis for prioritizing activities. In addition, other strategies addressed particular contaminants, restoration of individual lakes, or cleanup of contaminated areas. Ad hoc coordination among federal agencies, states, and other environmental organizations occurs in developing these strategies or when programmatic activity calls for coordination.

Although there are many strategies and coordination efforts ongoing, there is no one organization that is coordinating restoration efforts. The Water Quality Act of 1987 amended the Clean Water Act to charge GLNPO with coordinating actions within EPA for improving the Great Lakes' water quality, but the agency has not fully exercised this authority because it has not entered into agreements with other agency organizations regarding their Great Lakes activities as required by the Clean Water Act. GLNPO officials believe that they fulfilled their responsibilities under the act by

having federal agencies and state officials agree to the restoration activities discussed in the *Great Lakes Strategy 2002*; however, the strategy did not represent formal agreements to conduct specific activities with identified resources. Extensive strategizing, planning, and coordinating have not resulted in significant restoration. The ecosystem remains compromised and contaminated sediments in the lakes produce health problems, as reported by the IJC. Federal and state officials have cited a lack of funding as the chief barrier to restoration progress, but they mentioned that other barriers, such as the absence of an effective coordinating agency, also impede restoration progress.

Insufficient Data and Measures Prevent Determination of Overall Restoration Progress

The Great Lakes Water Quality Agreement, as amended in 1987, calls for establishing a monitoring system to measure restoration progress and assess the degree that the United States and Canada are complying with the goals and objectives of the agreement. Implementation of this provision has not progressed to the point that overall restoration progress can be measured or determined based on quantitative information. Recent assessments of overall progress, which rely on a mix of quantitative data and subjective judgments, do not provide an adequate basis for making an overall assessment. The current assessment process has emerged from a series of biennial State of the Lakes Ecosystem Conferences (SOLEC) initiated in 1994 for developing indicators agreed upon by conference participants. The number of indicators considered during the SOLEC conferences has been pared down from more than 850 indicators in 1998 to 80 indicators in 2000, although data was available for only 33 of them. While this lack of data precluded an overall quantitative-based assessment of the Great Lakes Basin, a qualitative assessment based on general observations was provided. The ultimate success of the SOLEC process in providing an overall quantitative-based assessment of the Great Lakes is uncertain because the assessment process relies on the voluntary participation of many federal, state, and local agency officials in an informal partnership arrangement. In addition, the objectives of the SOLEC process are not directly focused on developing a surveillance and monitoring program as envisioned in the agreement. Other indicators of environmental improvements reported for the numerous federal and state programs operating in the basin focus on program activities, often describing outputs, such as tons of contaminated sediment removed, rather than environmental outcomes, such as improvement of environmental conditions as a result of removing contaminated sediment.

Recommendations for Executive Action

To improve coordination of Great Lakes activities and ensure that federal dollars are effectively spent, GAO recommends that the Administrator, EPA, ensure that GLNPO fulfills its responsibility for coordinating programs within the Great Lakes Basin; charge GLNPO with developing, in consultation with the governors of the Great Lakes states, federal agencies, and other organizations, an overarching strategy that, clearly defines the roles and responsibilities for coordinating and prioritizing funding for projects; and submit a time-phased funding requirement proposal to the Congress necessary to implement the strategy.

To fulfill the need for a monitoring system called for in the GLWQA and to ensure that the limited funds available are optimally spent, GAO recommends that the Administrator, EPA, in coordination with Canadian officials and as part of an overarching Great Lakes strategy, (1) develop environmental indicators and a monitoring system for the Great Lakes Basin that can be used to measure overall restoration progress and (2) require that these indicators be used to evaluate, prioritize, and make funding decisions on the merits of alternative restoration projects.

Agency Comments

GAO provided EPA with a draft of this report for its review and comment. The agency generally agreed with the findings and recommendations in the report. EPA provided written comments; the full text of which is included in appendix V.

EPA stated that significant accomplishments have improved environmental conditions in the Great Lakes and that GAO's conclusions and recommendations can help ensure that more improvements are made. While EPA agreed with the overall conclusions, namely that better planning, coordination, monitoring, and the development of indicators are needed, it did not specifically address GAO's individual recommendations, stating that it would provide the Congress, GAO, and the Office of Management and Budget with a formal response to the final report recommendations at a later date.

EPA stated that while it can improve its delivery and coordination of restoration programs in the Great Lakes Basin, the complexities of the Great Lakes in terms of scope, geographical scale, and other factors require long-term, complex solutions implemented at a variety of levels. As GAO's report demonstrates, the complexity of the Great Lakes restoration effort provides the basis for the recommendation that EPA develop an overarching strategy that guides the multiple restoration efforts.

EPA highlighted two of its recent efforts to demonstrate compliance with its coordinating responsibilities under the Clean Water Act: the formation of the United States Policy Committee (USPC) and its subsequent release of the *Great Lakes Strategy 2002* and SOLEC for developing environmental indicators for the Great Lakes Basin. As GAO noted, these coordination efforts are significant but cannot be sustained over the long term given the uncertainties surrounding funding sources. Specifically, it provides extensive information on ongoing restoration efforts, but the *Great Lakes Strategy 2002* provides no commitment for funding and resources to assure its implementation. As such, the strategy remains largely a description of ongoing activities that assumes that federal and state restoration programs will maintain the status quo in both the extent of their efforts and funding. Similarly, the SOLEC process, which has successfully engaged a wide range of binational parties, remains a volunteer effort dependent on voluntary funding and does not replace the need to develop the surveillance and monitoring program envisioned in the Great Lakes Water Quality Agreement.

Chapter 1: Introduction

The United States and Canada view the Great Lakes as a valuable national natural resource that needs to be protected and restored to environmental health. The first bilateral agreement between the two countries to protect the Great Lakes was reached in 1972. Since that time further agreements have strengthened the commitment of the two countries to improve environmental conditions in the Great Lakes Basin. The Environmental Protection Agency (EPA), as the lead federal agency, is charged with ensuring that U.S. responsibilities are fulfilled. EPA's Great Lakes National Program Office (GLNPO) is authorized to implement various Great Lakes activities. States and other organizations also play a vital and integral role in fulfilling U.S. commitments. Despite early success in improving conditions in the Great Lakes Basin, significant environmental challenges remain, including increased threats from invasive species and cleanup of areas contaminated with toxic substances that pose human health threats.

The Great Lakes Are a Vital Resource

The five Great Lakes—Superior, Michigan, Huron, Erie, and Ontario—are a critical resource for the United States and Canada. The lakes form the largest freshwater system on Earth, accounting for 20 percent of the world's fresh surface water and over 95 percent of the U.S. fresh surface water supply for the contiguous 48 states. The lakes provide a drinking water source for over 26 million U.S. residents and water for the region's industry. Together, they form an inland waterway to the Atlantic Ocean that facilitates the relatively inexpensive transport of goods both within and outside the region. The lakes are also a recreational resource for boating, swimming, and sport fishing.

The Great Lakes Basin is a large area that extends well beyond the five lakes proper to include their watersheds, tributaries, connecting channels, and a portion of the St. Lawrence River. The basin encompasses nearly all of the state of Michigan and parts of Illinois, Indiana, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and the Canadian province of Ontario. (See fig. 1.)

Figure 1: Area Comprising the Great Lakes Basin

Sources: National Oceanic and Atmospheric Administration and GAO.

Recognizing the importance and mutual interest in the Great Lakes and other boundary waters, the United States and Canada signed the Boundary Waters Treaty in 1909. The treaty gave both countries equal rights to use the waterways that flow along the international border and provided that the boundary waters and waters flowing across the boundary not be polluted on either side to the point of injuring human health or the property of the other country. The treaty also established the International Joint Commission (IJC) as a permanent binational agency organized to help resolve and prevent disputes concerning the waters along the border.

With increased concern over contaminants in the Great Lakes, the governments of the United States and Canada signed the first international Great Lakes Water Quality Agreement (GLWQA) in 1972 to improve the environmental conditions in the lakes. The agreement focused on controlling phosphorus as a principal means of dealing with eutrophication in the lakes. In 1978, the two countries signed a new GLWQA, which was revised again in 1983. The 1978 agreement reflected an increased understanding of the scope of pollution problems in the

Great Lakes and 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 basin. The 1983 supplement added the requirement to further limit phosphorus discharges and for the two countries to prepare and implement plans for reducing phosphorus. In 1987, the agreement was revised for the last time to commit the two countries to cooperate with state and provincial governments to ensure, among other things, the development of Lakewide Management Plans (LaMP) to address environmental problems in open waters and Remedial Action Plans (RAP) for problems in designated "areas of concern" located in the basin. (See table 1.)

Table 1: Major Agreements between the United States and Canada Affecting the Great Lakes

Name of agreement	Key provisions
Boundary Waters Treaty of 1909	• Establishes the IJC as a permanent binational agency organized to help resolve and prevent disputes concerning the waters along the border. • Gives both countries equal rights to use the waterways that flow along the international border. • Provides that the boundary waters and waters flowing across the boundary are not to be polluted on either side to the point of injuring human health or the property of the other country.
Great Lakes Water Quality Agreement of 1972	• Provides for more effective cooperation to restore and enhance the Great Lakes. • Emphasizes finding solutions to the more obvious water quality problems.
Great Lakes Water Quality Agreement of 1978	• Establishes both general and specific water quality objectives for the Great Lakes. • Calls for developing and implementing programs to reduce and control phosphorus inputs to the lakes. • Requires a coordinated surveillance and monitoring program.
Phosphorus Load Reduction Supplement to the Great Lakes Water Quality Agreement of 1978, signed October 16, 1983	• Further specifies phosphorus inputs and required the preparation and implementation of plans for reducing phosphorus.
Protocol to the Great Lakes Water Quality Agreement of 1978, signed November 18, 1987	• Adds several annexes for issues to be addressed and activities to be conducted by the two governments. These included the development of RAPs and LaMPs, as well as addressing issues, such as airborne toxic substances, contaminated sediment, and control of phosphorus. • Requires a comprehensive review of the agreement's operation and effectiveness approximately every 6 years. • Calls for a monitoring system to measure restoration progress and assess the degree to which the United States and Canada are complying

Name of agreement	Key provisions
	with the goals and objectives of the agreement. • Calls for semi-annual meetings between the United States and Canada to coordinate work plans and evaluate progress in implementing the agreement.

Source: GAO.

In implementing the 1987 revisions to the agreement, officials for the two countries released complete LaMPs for four lakes in 2000—Erie, Michigan, Ontario, and Superior—and have updated them every 2 years. For Lake Huron, an alternative action plan was prepared instead of a LaMP. Implementation of RAPs for designated areas of concern (AOC)—namely sites that have failed to meet the objectives of the GLWQA and failures that have caused, or are likely to cause, impairment of beneficial uses, such as swimming or fishing—has not fared as well. The countries identified 43 contaminated areas: 26 located entirely within the United States, 12 located entirely within Canada, and 5 for which both countries share responsibility.[1] In 2002, we reported slow progress in cleaning up the contaminated areas and as of April 2002 none of the 26 areas under U.S. responsibility had been restored to beneficial use.[2] We also reported that the RAP process had either been abandoned or modified for several areas. We concluded that EPA was not effectively ensuring RAP implementation for contaminated areas. EPA subsequently took several steps to improve the RAP process, such as gathering information on the status of the contaminated areas and consolidating responsibility for the process within GLNPO.

In addition to two types of plans—LaMPs and RAPs—the agreement contains 16 other "annexes" that define issues that the two countries need to address and activities that they need to conduct, such as airborne toxic substances, contaminated sediment, and control of phosphorus. The 1987 amendment to the GLWQA included a provision that requires a comprehensive review of the agreement about every 6 years, focusing on the agreement's operation and effectiveness. A 1999 binational review of the agreement found that certain provisions of the agreement were out of date and concluded that certain changes should be considered; however, as of March 2003, the two countries had yet to revise the agreement.

[1] Two areas in Canada were restored and removed from the list of AOCs.

[2] See U.S. General Accounting Office, *Great Lakes: EPA Needs to Define Organizational Responsibilities Better for Effective Oversight and Cleanup of Contaminated Areas*, GAO-02-563 (Washington, D.C.: May 17, 2002).

EPA's Great Lakes National Program Office Is Responsible for Leading U.S. Efforts to Improve the Great Lakes Basin

The responsibility for leading the U.S. Great Lakes efforts rests with GLNPO. The Water Quality Act of 1987 amended the Clean Water Act to require EPA to lead and coordinate efforts with other federal agencies and state and local authorities to meet the goals in the agreement. It also established GLNPO within EPA to fulfill U.S. responsibilities under the agreement and to coordinate EPA's actions both at headquarters and the affected EPA regional offices. Specifically, the act requires GLNPO to

- cooperate with federal and state agencies in developing and implementing plans to carry out U.S. responsibilities under the agreement,
- coordinate EPA's efforts to improve water quality of the Great Lakes,
- monitor water quality in the Great Lakes, and
- serve as a liaison with Canada.

The Great Lakes Critical Programs Act of 1990 amended the Clean Water Act to further define GLNPO's role and required that all RAPs be submitted to the office and that the office take the lead in developing a LaMP for Lake Michigan. The act also assigned additional responsibilities to GLNPO in developing water quality standards for the Great Lakes and assessing contaminated sediment characteristics and remediation technologies. In addition to these responsibilities, GLNPO will help implement provisions of the Great Lakes Legacy Act of 2002, which authorized funds for cleaning up AOCs. Key provisions of these statutes are summarized in the following table:

Table 2: Major Statutes Affecting the Great Lakes

Name of statute	Key provisions

Water Quality Act of 1987	• Amends the Clean Water Act to provide that EPA should take the lead in coordinating with other federal agencies and state and local authorities to meet the goals in the agreement.
	• Establishes GLNPO within EPA to fulfill the U.S. responsibilities under the agreement and to coordinate EPA's actions at headquarters and the affected EPA regional offices. Specifically, it requires GLNPO to
	  • cooperate with federal and state agencies in developing and implementing plans to carry out the U.S. responsibilities under the agreement,
	  • coordinate EPA's efforts to improve water quality of the Great Lakes,
	  • monitor water quality in the Great Lakes, and
	  • serve as a liaison with Canada.

Great Lakes Critical Programs Act of 1990	• Requires that all RAPs be submitted to GLNPO. • Directs GLNPO to take the lead in developing a LaMP for Lake Michigan. • Provides additional responsibility for GLNPO in developing water quality standards for the Great Lakes and assessing contaminated sediment characteristics along with remediation technologies. • Requires that GLNPO be a separate line item in EPA's annual budget request.
Great Lakes Legacy Act of 2002	• Authorizes $50 million per year from fiscal year 2004 through 2008 for contaminated sediment projects in AOCs for which the United States has full or partial responsibility. • Requires EPA to report to the Congress by November 2003 on oversight of RAPs.

Source: GAO.

The legislative authorization of GLNPO was preceded by an uneven EPA commitment to addressing Great Lakes issues. In 1972, EPA's Region V Office in Chicago established the Office of Great Lakes Coordinator to monitor a demonstration program on the water quality in the Great Lakes and to conduct research. In 1978, the region established a larger coordinating office, also named the Great Lakes National Program Office, to direct and oversee fulfillment of the U.S. obligations for the agreement and any spending for that purpose. As we reported in 1982, that office had difficultly obtaining cooperation from other agency offices to fulfill its mission, leading us to recommend that GLNPO be allowed to coordinate actions within EPA, other federal agencies, and states in developing

strategies to improve Great Lakes' water quality.[3] In the years immediately following our report, however, the administration excluded GLNPO from the agency's budget proposal. The Congress restored the funding each time it was excluded from the budget and the region provided staff and other support for the office. The Water Quality Act of 1987 required the EPA Administrator to include in the agency's annual budget submission to the Congress a separate budget line item for GLNPO. According to GLNPO officials, recent GLNPO budgets have been generally funded by the Congress at the previous years' level or somewhat greater.

GLNPO is a unique entity within EPA. Unlike other EPA entities that have responsibility for an overall media, such as EPA's Office of Air, GLNPO is focused on a wide range of environmental issues in a specific geographical area of the country. GLNPO and its staff are not physically located with other national program offices in EPA headquarters, and its staff of about 40 professionals is relatively small when compared with EPA's other national programs. The manager is also selected differently than other program office heads. The Great Lakes National Program Manager is the Regional Administrator for EPA's Region V, as opposed to an individual appointed to specifically head a national program office, such as the Office of Water within EPA.

States and Other Organizations Actively Participate in Great Lakes Environmental Activities

States, provincial governments, international organizations, local organizations, independent commissions, and nonprofit organizations are all involved in Great Lakes issues. The eight Great Lake states and the provincial governments of Ontario and Quebec in Canada have historically played key roles in Great Lakes activities. The GLWQA envisioned that the two countries would cooperate with states and provincial governments on a variety of matters, including the development of RAPs for contaminated areas and monitoring environmental conditions within the basin. State and provincial government involvement is necessary for implementing other agreements, such as the *Great Lakes Binational Toxics Strategy* and the *Great Lakes Strategy 2002*. Similarly, the federal government's partnerships with the states are essential for implementation of EPA's Great Lakes and other environmental initiatives.

[3] See U.S. General Accounting Office, *A More Comprehensive Approach Is Needed To Clean Up The Great Lakes*, CED-82-83 (Washington D.C.: May 21, 1982).

The IJC assists in the implementation of the agreement between the two countries, reports every 2 years on implementation progress, and offers recommendations to the two countries. The GLWQA created three binational organizations to assist the IJC in its oversight role:

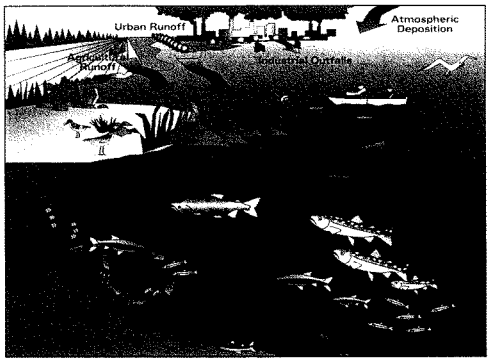
- Great Lakes Water Quality Board, which is the principal adviser to the IJC and is composed of an equal number of Canadian and U.S. members, including representatives from the governments and each state and provincial government.
- Great Lakes Science Advisory Board, which advises the IJC and the Water Quality Board on research and scientific matters. The board is comprised of managers of Great Lakes research programs and recognized experts.
- Great Lakes Regional Office in Windsor, Ontario, which provides administrative and technical support to the boards and operates a public information service for the IJC.

In addition, the IJC has established several other organizations that provide advice and assistance, including the Council of Great Lakes Research Managers, the International Air Quality Advisory Board, and the Health Professionals Task Force.

Significant Environmental Challenges Remain to Restore the Great Lakes

Despite early successes in cleaning up the nation's water, the Great Lakes Basin continues to face significant environmental challenges. Specifically, 41 areas within the Great Lakes, contaminated with toxic substances, need cleanup actions to restore beneficial uses, such as swimming and fishing. Water polluted with toxic substances still flows into the Great Lakes from specific points, such as wastewater treatment plants, and also from nonpoint sources, such as sediment runoff from agricultural land and urban areas. Nonnative species continue to invade the Great Lakes, threatening to interrupt the ecological balance in the region. The number of invasive species increased steadily throughout the 1900s, and the basin now contains more than 160 nonnative species that threaten native fish and plants. Figure 2 illustrates the various sources of pollution to the Great Lakes.

Figure 2: Pollution Sources to the Great Lakes



Source: EPA

One of the initial environmental successes in the Great Lakes has been the significant reduction in the amount of phosphorus that municipal waste treatment facilities discharged into the lakes. Phosphorus causes excessive algae growth, which greatly reduced the quality of fish populations in the Great Lakes. With improved waste treatment facilities and reduction of phosphates in detergents, phosphorus levels in the Great Lakes were reduced and fish populations improved. However, a portion of Lake Erie remains a "dead zone" no longer able to support fish populations, and this problem appears to be worsening since 1990.

Another notable success was the control of certain invasive species, such as the sea lamprey. The sea lamprey was first found in Lake Ontario and quickly spread through out the Great Lakes. Lampreys attached to native fish, feeding on the body fluids and leaving them either scarred or dead. Federal, provincial, and state governments initiated control measures that have reduced the populations significantly.

Objectives, Scope, and Methodology

Fourteen members of Congress participating on the Great Lakes Task Force asked us to (1) identify the federal and state environmental programs operating in the Great Lakes Basin, (2) evaluate restoration strategies used and how they are coordinated, and (3) assess overall environmental progress made in the basin restoration effort.

To identify environmental programs operating in the Great Lakes Basin, we used a structured data collection instrument provided to each of the 8 Great Lakes states—Illinois, Indiana, Ohio, Michigan, Minnesota, New York, Pennsylvania, and Wisconsin—and 13 federal agencies. For each program, we requested information about the program's purpose, the restoration strategies being used, the extent of program coordination with other federal or state agencies, the amount of funding provided, and the overall environmental progress achieved in restoration efforts. A detailed listing of federal and state agencies that provided program information is included as appendix I.

Furthermore, we interviewed and gathered program documentation from officials representing EPA's Office of Water, Office of Air and Radiation, Office of Research and Development, Office of Solid Waste and Emergency Response, and Great Lakes National Program Office, along with the U.S. Army Corps of Engineers (the Corps). These organizations were selected because they have major responsibilities for Great Lakes cleanup and restoration efforts and account for the majority of funds expended for Great Lakes programs. To obtain additional information on state programs, we interviewed state officials from five of the eight Great Lakes states—Michigan, Minnesota, Ohio, New York, and Wisconsin. These states were selected because they reported the majority of state programs involved in basin restoration. We also gathered and analyzed documentation from other governmental and nongovernmental organizations involved in restoration activities, including counties, townships, conservation districts, and nonprofit organizations.

To evaluate how restoration strategies were used and how they were coordinated, we reviewed and analyzed the data collection instrument responses received from federal and state program officials. From these responses, we identified various coordination methods and determined whether coordination was ongoing or infrequent and whether it was informal or formally documented in a written agreement. We obtained and analyzed strategies for the basin prepared by various organizations or working groups. These strategies were categorized as to whether they were basin-wide strategies or whether they addressed specific environmental problems, such as controlling mercury pollution, or

geographical areas, such as controlling point source pollution for Lake Superior. For the recent basin strategy developed by a committee of regional federal and state officials in 2002, we interviewed officials representing GLNPO, other federal agencies, and states involved in developing the strategy to further understand the strategy's goals, objectives, and resources available to carry out the strategy. We also evaluated the agencies' efforts to coordinate the various strategies.

To determine overall environmental progress made in basin restoration efforts, we obtained and analyzed Great Lakes progress reports prepared by representatives of the United States and Canada in response to the GLWQA. We interviewed GLNPO officials to understand the process for gathering information and reaching conclusions on progress contained in the reports. We gathered and analyzed information on the development of environmental indicators used as part of the reporting process and interviewed GLNPO officials regarding the resources available and implementation plan for monitoring agreed-upon indicators. In our effort to determine the progress environmental programs operating in the basin have achieved, we obtained information on the program accomplishments from responses to the data collection instrument and interviews with various federal and state program officials. We used these responses and studies to identify barriers to developing indicators and overall restoration progress in the Great Lakes.

We provided EPA with a draft of this report for review and comment. EPA's written comments are presented in appendix V. In addition, we received technical comments from EPA that we have incorporated throughout the report as appropriate and technical comments from state and federal program officials on the information and characterization of information they provided.

We conducted our work from May 2002 through March 2003 in accordance with generally accepted government auditing standards.

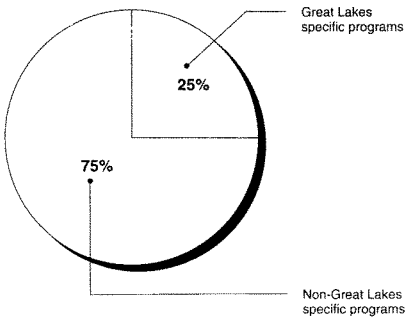
Chapter 2: Numerous Federal and State Environmental Programs Operate in the Great Lakes Basin

About 200 federal and state environmental programs operate within the Great Lakes Basin. Most of these programs involve the localized application of national or state initiatives and do not specifically focus on unique basin concerns, but about 50 specifically address environmental conditions in the basin. The majority of the programs are administered by federal agencies, and for the broad-based programs it is difficult to identify program expenditures that apply to the basin. For the Great Lakes specific programs, expenditures totaled about $1.4 billion over 10 years, with the majority of expenditures coming from state programs. In addition to these program expenditures, the Corps of Engineers expended about $358 million on specifically authorized projects within the basin.

Most Programs Operating in the Great Lakes Have a Nationwide or Statewide Focus

Most of the federal or state programs that address environmental conditions in the Great Lakes Basin operate both within and outside of the basin. Of the 148 federal and 51 state programs operating both within and outside the basin, 149 federal and state programs were identified by agency officials as being designed to address environmental conditions at a nationwide or statewide level, while 50 programs provide Great Lakes specific restoration efforts. (See fig. 3.)

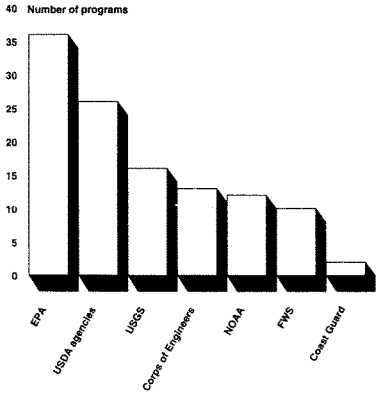
Figure 3: Percentage of Non-Great Lakes Specific and Great Lakes Specific Programs Operating in the Great Lakes Basin



Source: GAO

Of the 149 non-Great Lakes specific programs, 115 are federal programs administered by 11 federal agencies and 34 are state programs administered by 7 states that provide a wide range of restoration activities that either directly restore or support restoration activities. EPA and agencies within the U.S. Department of Agriculture (USDA) administer most of the federal programs. The U.S. Army Corps of Engineers (the Corps); the Department of the Interior's U.S. Geological Survey (USGS) and Fish and Wildlife Service (FWS); the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA); and the Department of Homeland Security's U.S. Coast Guard administer the remaining ones. (See fig. 4.)

Figure 4: Federal Non-Great Lakes Specific Programs



Sources: EPA, USDA, USGS, NOAA, FWS, Corps of Engineers, Coast Guard, and GAO.

Generally, federal and state programs fund a diverse number of activities relating to cleanup of contaminated areas, habitat restoration, pollution prevention, and research that benefit the basin and other geographical areas outside of the basin. For example, EPA's RCRA Subtitle I Underground Storage Tanks and Leaking Underground Storage Tanks program regulates the use of underground petroleum tanks to prevent the

contamination of drinking water nationwide. This program addresses associated activities in the basin. Likewise, the Conservation Reserve Program administered by the Department of Agriculture's Farm Service Agency (FSA) provides payments to agricultural landowners to establish long-term, resource conserving vegetative cover on eligible farmland for reducing erosion. Some of this funding benefits activities in the basin. The National Fish Passage Program administered by FWS helps the basin and other areas of the country restore native fish and other aquatic species to self-sustaining levels by funding projects to facilitate unimpeded flows and fish movements by removing barriers or providing ways for fish to bypass barriers.

Additionally, non-Great Lakes specific research programs provide information that helps support restoration activities. For example, EPA's Aquatic Stressors Research Program funds research activities to advance scientifically sound approaches for monitoring trends in ecological conditions of the nation's aquatic resources, including the Great Lakes. Another program is the Coastal Remote Sensing, Coastal Change and Analysis program administered by NOAA, which develops and distributes regional landscape data through remote sensing technology. The program develops baseline land cover and characterization information for coastal areas.

Officials from 7 of the 8 Great Lakes states reported 34 state programs that affect areas both within and outside the basin. Of the 34 programs, 13 are in Minnesota, 7 in Ohio, 6 in Wisconsin, 4 in New York, 2 in Pennsylvania, and 1 each in Indiana and Michigan. The programs cover a wide range of activities directly involved in restoration or supporting restoration activities. For example, the Minnesota Mercury Initiative program, which was created in 1999 to reduce mercury contamination in fish by curtailing air deposition of mercury in state waters, solicits voluntary mercury reductions from large companies to achieve its goals. Similarly, Ohio's Ground Water Resources program fosters development of groundwater as a viable and sustainable water supply both within and outside the basin and involves collecting and distributing information on groundwater resources in the Lake Erie and Ohio River Basins. A detailed listing of all federal and state non-Great Lakes specific programs is included as appendix II.

The portion of expenditures devoted to activities in the basin for most of these general federal and state programs is generally not available. However, the following examples provide expenditure information on some of the programs:

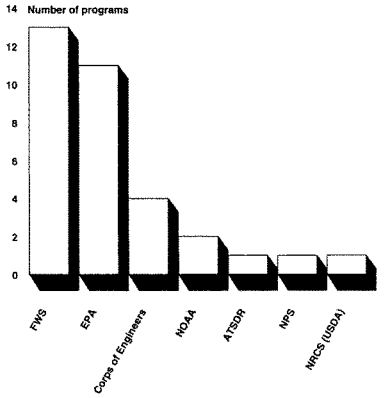
- EPA's Superfund program officials calculated that EPA's Region V, which encompasses 6 of the 8 Great Lakes states, expended $745.6 million on cleanup activities within the basin during fiscal years 1992 through 2001.
- NOAA's National Sea Grant College Program, which supports education programs and research relating to the development of marine resources, expended $69.6 million for the basin during fiscal years 1995 through 2001.
- The Corps' Shore Protection Program, which provides project funding for planning and constructing structures for protecting shores against waves and currents, expended just over $1 million for these activities in the basin during fiscal years 1992 through 2001.

Expenditure data for activities in the basin was available for 53 of the 115 federal non-Great Lakes specific programs and totaled about $1.8 billion during fiscal years 1992 through 2001. Similarly, expenditures for activities in the basin for 14 state non-Great Lakes specific programs were about $461.3 million in state fiscal years 1992 through 2001.

Great Lakes Specific Environmental Programs Focus on Certain Geographic Areas or Problems

We identified 50 federal and state programs that focus specifically on addressing environmental conditions within the basin. Of these, 33 are Great Lakes specific programs that are funded by federal agencies while 17 programs are funded by 7 states. FWS and EPA conduct most of the federal programs while three agencies identified one program each—Interior's National Park Service (NPS), USDA's Natural Resource Conservation Service (NRCS), and the Department of Health and Human Service's Agency for Toxic Substances and Disease Registry (ATSDR). (See fig. 5.)

Figure 5: Number of Great Lakes Specific Programs by Federal Agency



Sources: FWS, EPA, Corps of Engineers, NOAA, ATSDR, NPS, NRCS, and GAO.

The federal programs support a variety of activities, such as research, cleanup, restoration, pollution prevention, and other activities that directly focus on Great Lakes environmental issues. For example:

- EPA's Niagara River Toxics Management Plan program focuses on reducing toxic chemicals input into the Niagara River, achieving ambient water quality, and improving and protecting the water quality of Lake Ontario. The program began in 1987, and funding for remediation efforts comes from two EPA programs.

- EPA's Great Lakes Air Deposition Program funds projects to better understand the impacts of atmospheric deposition of pollutants, such as mercury and other toxics, which are a major source of contamination. The program funds projects in monitoring, modeling, and emissions inventory development, which assist in identifying pollution sources.

- The Corps' Great Lakes Remedial Action Plans and Sediment Remediation program provides technical support to the development

and implementation of remedial action plans to clean up contaminated areas in the Great Lakes. Funds are provided for planning and administrative implementation activities and may not be used for actual construction cleanup.

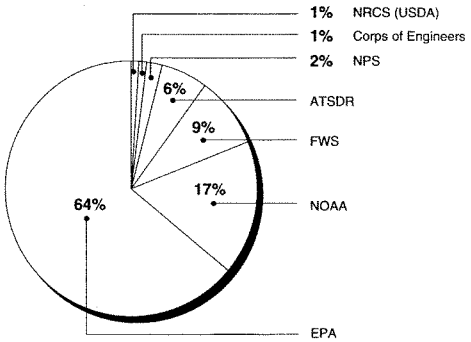
- FWS's Lake Trout Restoration program began in the late 1970s to rehabilitate the lake-trout populations in Lake Erie and Lake Ontario. The goal of the program is to increase the population of native lake trout to a level where it is self-sustaining through natural reproduction, with a harvestable annual surplus.

- USDA's Great Lakes Basin Program for Soil Erosion and Sediment Control, administered by NRCS, focuses on improving Great Lakes water quality by preventing soil erosion through education programs, grants, and technical assistance. Runoff from agricultural land is a source of nonpoint pollution to the Great Lakes.

- FWS's Lower Great Lakes Ruffe Surveillance program, which began in 1993, provides surveillance activities for the ruffe—a nonnative fish that competes with native species, such as walleye and perch. The surveillance activities include monitoring, detecting newly established populations, tracking existing populations, and evaluating current control and management activities.

EPA, NOAA, and FWS provide most of the funding for Great Lakes specific programs. Of the $387.4 million expended by federal agencies for these programs during fiscal years 1992 through 2001, 64 percent, or $248.9 million, was for EPA programs; 17 percent, or $67.2 million, for NOAA programs; and 9 percent, or $33.4 million, for FWS programs. (See fig. 6.)

Figure 6: Percentage of Expenditures for Great Lakes Specific Programs by Federal Agency, Fiscal Years 1992 through 2001



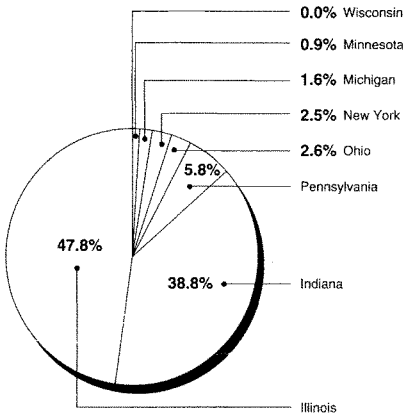
Sources: EPA, FWS, NOAA, NPS, NRCS, ATSDR, Corps of Engineers, and GAO.

While ongoing Great Lakes specific federal programs fund various restoration activities, the Corps funds additional activities through specifically authorized environmental projects that do not fall under its ongoing programs. Most of these projects are authorized under the biennial Water Resources Development Act (WRDA) and are for project studies or construction. Once authorized, these projects can be funded through the annual Energy and Water Appropriations Acts. For most projects, the Corps can only expend the funds if local partners meet the cost-sharing requirements established by the authorization. For example, specific local government projects for wastewater facilities or combined sewer overflow mitigation identified in WRDA cannot be funded until a cost-sharing agreement is reached with the local government. In addition to projects authorized in WRDA, projects may be authorized and initial funding provided through the annual appropriation process.

In fiscal years 1992 through 2001, the Corps expended approximately $358 million on specifically authorized projects. These projects funded a variety of activities, such as the $93.8 million restoration of Chicago's shoreline and the $78.7 million for restoring the Little Calumet River in Indiana. According to a Corps official, many projects are authorized in this manner

because of the unique nature or scope of the project or because of the capabilities of states and local organizations to fund projects. Two states, Illinois and Indiana, received the majority of specific project funding during fiscal years 1992 through 2001, as shown in figure 7.

Figure 7: Percentage of Expenditures for Specifically Authorized Projects Received by Great Lakes States, Fiscal Years 1992 through 2001



Source: U.S. Army Corps of Engineers.

Information on the individual Corps projects funded during fiscal years 1992 through 2001 for the basin is contained in appendix III.

In addition to the federal programs and specifically authorized Corps projects, 17 state Great Lakes Basin specific programs fund a wide range of activities that address unique state concerns or problems in the Great Lakes. The following examples of some specific state programs show the range of activities that states undertake.

- Ohio's Shore Structure Permit Program protects the Lake Erie shoreline by providing assistance to coastal residents and communities in the proper design and construction of structures for controlling

erosion, wave action, and flooding along or near the shoreline. The program began in the 1930s, and funding is provided from state lease revenues for mining mineral resources from the bed of Lake Erie.

- The Clean Michigan Initiative provides general obligation bond funding for environmental activities in Michigan. These activities include Brownfields redevelopment, nonpoint source pollution control, cleanup of contaminated sediments, and pollution prevention. About $255.9 million was expended for projects throughout Michigan, with only a small portion of the state's land area extending outside the basin.

- Pennsylvania established the Office of the Great Lakes, which provides administrative oversight and support to other state offices that have environmental responsibilities. It funds staff travel, salary, and administrative costs of about $100,000 per year for outreach and education activities. Restoration of a particular contaminated area in Lake Erie, Presque Isle Bay, is a major focus of the office's activities.

The states' Great Lakes specific programs include those funded through the Great Lakes Protection Fund. The Great Lakes Governors created and incorporated the fund as a permanent endowment, with each state providing a fixed contribution amount based on the average use of Great Lakes water from 1976 through 1985.[4] Each participating state receives one-third of the fund's annual income based on its proportional endowment contribution. Payments to the states totaled about $31 million from years 1990 through 2001, but payments were suspended in 2002 because of low fund investment performance. States use the funds to support a wide range of basin activities. For example, Michigan funds research projects undertaken by universities and for-profit groups in areas such as toxics and aquatic nuisance species. Minnesota's dividends from the fund are relatively small, and therefore they are combined with state-funded projects, such as a mercury control project and a project retrofitting a sampling vessel. Ohio's program involves the award of grants that support research and implementation projects, in alternating years, and require 10 percent matching funds by the recipient. New York uses its program to fund research, environmental planning, monitoring, and field assessment, and the state has mandated that monies cannot be used to fund construction or cleanup activities. In addition to paying out state dividends, the fund supported 191 grants for regional projects totaling

[4] Indiana does not participate in the Great Lakes Protection Fund.

about $40 million. These grants were awarded from the remaining two-thirds of the fund's undistributed income.

Of the 17 state Great Lakes specific programs, 5 were funded by Michigan, 4 by Ohio, 3 by Wisconsin, 2 by Pennsylvania, and 1 each by Illinois, Minnesota, and New York. Total expenditures for the programs were about $956 million during fiscal years 1992 through 2001. Michigan programs accounted for 96 percent of the expended amount because of major expenditures for three state programs and about 99 percent of the state's border lies within the basin. A detailed listing of all federal and state Great Lakes specific programs is included as appendix IV.

Foundations and Other Organizations Fund Great Lakes Restoration Activities

Besides federal and state government agencies, other organizations, such as foundations, fund a variety of restoration activities in the Great Lakes Basin by providing grants to nonprofit and other organizations, including government agencies. Specifically, four foundations and one trust provide funds for restoration activities.

- The Joyce Foundation supports various public policy initiatives, including long-term efforts to protect the Great Lakes environment, and provides grants to organizations for environmental projects, such as a grant to support activities that examine institutional issues facing the Great Lakes ecosystem.

- The Charles Stewart Mott Foundation supports efforts to conserve freshwater ecosystems in North America, including the Great Lakes. Grants are provided to improve capacity building for environmental organizations and to protect and restore selected freshwater ecosystems through conservation activities.

- The George Gund Foundation provides support for conservation efforts within the Great Lakes Basin and is particularly interested in capacity building of nonprofit environmental organizations. Grants are provided to organizations, such as the National Wildlife Federation, to support ongoing efforts to reduce the contamination of waters by airborne mercury.

- The Delta Institute funds activities for the development of policies and practices for sustainable development and environmental stewardship in the Great Lakes region. Among other things, the Delta Institute provides funding for the development of Lakewide Management Plans,

the Lake Michigan Regional Air Toxics Strategy, and the Lake Erie Fish Consumption Advisory Education Project.

- The Great Lakes Fishery Trust provides grants to nonprofit and governmental organizations to benefit Great Lakes fishery resources, such as a grant to FWS to develop a management plan for lake sturgeon. The trust was created as part of a court settlement for fish losses at a hydroelectric facility in Michigan, and the trust manages the assets of the settlement.

In addition to these organizations, other governmental and nongovernmental organizations fund restoration activities. For example, individual municipalities, such as the City of Toledo, Ohio, led and funded a demonstration project to develop a process for physically stabilizing and isolating contaminated sediment under a permeable covering to avoid dredging the sediment. Municipalities are also instrumental in funding projects to improve wastewater treatment facilities that discharge treated water into the Great Lakes. Several municipalities participate in the International Association of Great Lakes and St. Lawrence Mayors, which holds annual conferences to adopt unified positions and make recommendations for the protection, promotion, and development of the Great Lakes. Counties and township governments also fund environmental activities that benefit the Great Lakes. For example, township governments may have growth development plans that include conservation objectives to help control pollution and preserve open areas in the township. Counties in the Great Lakes Basin fund activities and projects to control nonpoint source pollution, soil erosion, and wildlife areas. Conservation districts within counties provide technical assistance and education in areas such as erosion control and agricultural chemical control. Within the basin, there are 213 counties and 209 conservation districts that support conservation or restoration activities within the Great Lakes Basin.

Numerous nongovernmental organizations also provide coordination roles, policy perspectives, or financially support restoration activities, including the following:

- Council of Great Lakes Governors, a partnership of governors from the eight Great Lakes States and the Canadian Premiers of Ontario and Quebec, encourages and facilitates environmentally responsible economic growth throughout the Great Lakes region.

- Great Lakes Commission, an agency promoting the orderly, integrated, and comprehensive development, use, and conservation of water and related natural resources of the Great Lakes Basin and the St. Lawrence River, includes representatives from the eight Great Lakes states and the Canadian provinces of Ontario and Quebec.

- Great Lakes Fishery Commission, created by the Canadian and U.S. Convention on Great Lakes Fisheries in 1955, coordinates fisheries management and research, and management of sea lamprey. The U.S. Department of State and Canada's Fisheries and Ocean Department provide funding for the commission.

- International Association for Great Lakes Research, a scientific organization comprised of researchers studying the Great Lakes and other large lakes of the world, hosts annual conferences and publishes the *Journal of Great Lakes Research*.

- Great Lakes Research Consortium, an organization of 16 colleges and universities in New York, with 9 affiliate campuses in Ontario, dedicated to collaborative research and education on the Great Lakes, focuses its activities on improving and understanding the Great Lakes ecosystem, including the physical, biological, and chemical processes along with the social and political forces that affect human impact on the lakes.

- Great Lakes United, an international coalition organization focused on preserving and restoring the Great Lakes-St. Lawrence River ecosystem, promotes effective policy initiatives, carries out education programs, and promotes citizen action and grassroots leadership for Great Lakes environmental activities. The coalition is made up of member organizations representing environmentalists, conservationists, hunters and anglers, labor unions, communities, and citizens of the United States, Canada, and First Nations and Tribes.

- Lake Michigan Federation, which works to restore fish and wildlife habitat, conserve land and water, and eliminate toxics in the watershed of Lake Michigan.

- The Nature Conservancy, whose mission is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters that need to survive. The major initiative of the Nature Conservancy's Great Lakes Office is the Great Lakes Planning Initiative. The initiative has designated 270 priority sites for conservation in the Great Lakes and is in the process

of developing a planning document for each of these sites that will guide conservation work and coordination with other organizations and agencies.

- The Northeast-Midwest Institute, a private, nonprofit, and nonpartisan research organization dedicated to economic vitality, environmental quality, and regional equity for Northeast and Midwest states, has a major area of emphasis on the Great Lakes and has issued several reports on a variety of Great Lakes topics.

While these organizations are involved in Great Lakes activities, each is unique in terms of why it was created, its goals and objectives, scope of operations, and funding source. Several of the organizations are binational, such as the Great Lakes Commission and Great Lakes United, and focus only on Great Lakes issues. For other organizations, such as The Nature Conservancy and the Northeast-Midwest Institute, the Great Lakes are one of several issues addressed by the organizations.

Chapter 3: Multiple Programs, Different Strategies, and a Lack of Coordination Impede Restoration Efforts

The magnitude of the area comprising the Great Lakes Basin and the many environmental programs operating within the basin require the development of one overarching strategy to address and manage the complex undertaking of restoring the basin's environmental health. The Great Lakes region cannot hope to successfully receive support as a national priority without a publicly accepted, comprehensive plan for restoring the Great Lakes. In lieu of such a plan, organizations at the binational, federal, and state levels have developed their own strategies for the Great Lakes, which have inadvertently made the coordination of various programs operating in the basin more challenging. Although coordination among federal agencies, states, and other environmental organizations occurs when strategies are being developed or when programmatic activity calls for coordination, the myriad of current strategies and coordination efforts makes it difficult to determine which organization is in charge. While the Great Lakes National Program Office (GLNPO) has authority for coordinating Environmental Protection Agency (EPA) and other federal efforts, it has not fully exercised its authority. Numerous strategizing, planning, and coordinating efforts have not resulted in extensive restoration activity because of a lack of funding and other barriers.

An Overarching Strategy and Clear Responsibilities Are Needed for Management of Large Watershed Restoration Projects

The Great Lakes region cannot be successfully supported as a national priority without a publicly accepted, comprehensive plan for restoring the Great Lakes. Clearly defined responsibilities for coordination are essential for effective management of large watershed restoration projects. An overarching strategy and governance process to guide restoration activities that transpire over many years have been developed for other large ecosystem restoration projects. The Great Lakes Basin lacks an overarching strategy and in its absence, numerous strategies have been developed to address environmental activities, each with a different purpose and scope. Some strategies attempt to address the entire basin while others are focused on specific environmental problems or geographical areas.

Overarching Strategies Are Essential to Guide Restoration Efforts

Because of the complexity of large ecosystem restoration projects and multiple stakeholders, restoration efforts for other large ecosystems, such as the South Florida ecosystem and the Chesapeake Bay, have developed overarching strategies to guide their activities. These strategies were deemed essential by the organizations involved in the efforts for guiding activities that would occur over extended time periods and with multiple stakeholders whose participation may change over time.

The South Florida ecosystem is a large restoration project initiative with an overall strategic plan to guide its restoration activities. This ecosystem covers a large geographical area that encompasses a major portion of South Florida, including the Everglades wetlands. Numerous changes brought on by urbanization, agricultural activities, and federal efforts to control flooding have detrimentally affected the ecosystem. In response to growing deterioration of the ecosystem, federal agencies established a task force in 1993 to coordinate their restoration activities. In 1996, the task force was expanded to include state, local, and tribal members and was formalized in the Water Resources Development Act of 1996. However, as we reported in 1999, a strategic plan had not been developed laying out how the restoration initiative would be accomplished, including quantifiable goals and performance measures.[5] Without a strategic plan, we noted the ability to accomplish the restoration initiative in a timely and efficient manner was at risk because of its complexity and a mechanism was needed to provide the authority for making management decisions. In a subsequent report,[6] we noted that a strategic plan for the ecosystem would clearly communicate to the Congress and other participants in the restoration effort what it is trying to achieve, the time frames for achieving the expected results, and the level of funding that would be needed. Such a plan was also needed because of the inevitable personnel turnover in task force representation occurring over time and the subsequent need to inform new task force members of restoration progress.

The strategic plan developed for the South Florida ecosystem by the task force made substantial progress in guiding the restoration activities. The plan, which the task force submitted in July 2000, identifies the resources needed to achieve restoration and assigns accountability for specific actions for the extensive restoration effort estimated to cost $14.8 billion. As we reported in 2001, the plan needed additional elements, including a clear picture of how the restoration will occur and linkage between strategic goals and outcome-oriented goals for tracking and measuring restoration progress. The restoration effort was elevated to nationwide recognition with the authorization of the Comprehensive Everglades

[5] See U.S. General Accounting Office, *South Florida Ecosystem Restoration: An Overall Strategic Plan and a Decision-Making Process Are Needed to Keep the Effort on Track*, GAO/RCED-99-121 (Washington, D.C.: Apr. 22, 1999).

[6] See U.S. General Accounting Office, *South Florida Ecosystem Restoration: Substantial Progress Made in Developing a Strategic Plan, but Actions Still Needed*, GAO-01-361 (Washington, D.C.: Mar. 27, 2001).

Restoration Plan (CERP) in the Water Resources Development Act of 2000 (P.L. 106-541). This act contained provisions specifying the coordination among stakeholders, the funding responsibilities, and the authorization for program regulations.

The Chesapeake Bay watershed is another example of a large restoration effort with an overarching strategy. In a 1983 agreement to restore the Chesapeake Bay, the states of Maryland, Virginia, and Pennsylvania; the District of Columbia; the Chesapeake Bay Commission; and EPA signed an agreement to protect and restore the Chesapeake Bay ecosystem. The participants saw the need to establish an executive council to marshal public support for the bay effort and be accountable to the public for progress made under the agreement. Under the 1983 agreement, the executive council must meet at least twice yearly to assess and oversee the implementation of coordinated plans to improve and protect the water quality and living resources of the bay. The council established an implementation committee of agency representatives to coordinate technical matters and the development and evaluation of management plans. In a subsequent agreement, Chesapeake 2000, the partners agreed to a new ecosystem approach to the bay. While continuing to focus restoration efforts on individual species and habitat, such as the blue crab and the oyster reef, the new agreement recognizes the linkage among these efforts and addresses their interdependence within the context of a single, broad ecosystem approach. Several reports by the council have detailed the status of progress toward the goals set forth in the agreements.

The South Florida ecosystem and the Chesapeake Bay watershed are large ecosystems with overarching strategies, but the overall area and population affected by these ecosystems are significantly less than the Great Lakes Basin. The Great Lakes influence more people, land, water, and states by a substantial margin. The population within the basin is more than five times that of the population near the South Florida project and more than twice the population near the Chesapeake Bay. The basin comprises more than 11 times the area of the South Florida project and more than 3 times the area of Chesapeake Bay. Moreover, the basin encompasses eight states as opposed to one state for the South Florida project and six states and the District of Columbia for the Chesapeake Bay watershed. (See table 3.)

Table 3: Geographic Area, Population, and States for Three Restoration Areas

Restoration area	Area size (in square miles)	Area population	Number of affected states
Great Lakes Basin	201,000	33 million	8
Chesapeake Bay watershed	64,000	16 million	6
South Florida ecosystem	18,000	6 million	1

Sources: Environment Canada, EPA, and GAO.

Strategies for the Great Lakes Do Not Provide an Overarching Restoration Approach

Numerous strategies developed for the Great Lakes Basin address environmental restoration activities with different perspectives, purposes, and scopes. Several comprehensive strategies attempt to address restoration activities for the entire basin. Other strategies address a particular concern or geographic area. However, none of the current strategies provides an overarching approach that can be used as a restoration blueprint to guide overall activities similar to the South Florida ecosystem restoration.

The most recent comprehensive strategy developed for the entire basin—the *Great Lakes Strategy 2002*—was developed by the U.S. Policy Committee (USPC), a group of mostly federal regional, and state officials and coordinated by GLNPO. The group focused on federal, state, and tribal government activities as they relate to environmental protection and natural resource management and to fulfilling the goals of the Great Lakes Water Quality Agreement (GLWQA). The strategy sets forth goals, objectives, and actions in various environmental issues, such as storm water discharges, along with goals, objectives, and key actions to achieve for these issues. The strategy also recognizes the other strategies that have been developed for the Great Lakes. Developing the strategy occurred over several months, requiring significant time and efforts by GLNPO and USPC members to agree on the various goals, objectives, and actions. GLNPO officials plan periodic follow-up with USPC representatives to determine the progress made in reaching the objectives. Toward this end, GLNPO has prepared a matrix listing over 100 planned actions for achieving the objectives and will conduct follow-up inquiries with the responsible agency officials to determine progress as an accountability mechanism.

The *Great Lakes Strategy 2002* provides extensive information on planned activities to achieve the objectives, but it is largely a descriptive

compilation of existing program activities that relates to basin restoration. For example, the strategy addresses Brownfields redevelopment by identifying the number of Brownfields sites within the basin and describing ongoing Brownfields activities.[7] The key action called for in the strategy is to continue support for local Brownfields redevelopment efforts through various planned or ongoing activities at the state and federal levels. The strategy also promotes clean and healthy beaches by noting that EPA will implement the Beaches Environmental Assessment and Coastal Health Act of 2000. The act requires all states with coastal waters, including the Great Lakes states, to review water quality criteria for coastal recreation waters and adopt protective water quality standards.

To attain the strategy's objectives, federal and state agencies need to provide level funding to avoid modification of the planned actions and activities, according to GLNPO officials. The strategy states that "(it) should not be construed as a commitment by the U.S. government for additional funding and resources for its implementation. Nor does it represent a commitment by the U.S. government to adopt new regulations."[8] GLNPO officials agreed that the strategy continues with the status quo and is a statement of what they hope to accomplish with better coordination. Some state officials involved in developing the strategy stated that state actions described in the strategy were already planned and that implementation is contingent on states funding the relevant environmental programs.

In 2001, the Great Lakes Commission published another basin strategy, *The Great Lakes Program to Ensure Environmental and Economic Prosperity*, which outlines seven major goals for the Great Lakes Basin. The goals are

- cleaning up toxic hot spots,
- preventing the introduction or limiting the spread of invasive species,
- controlling nonpoint source pollution,
- restoring and conserving wetlands and critical coastal habitat,
- ensuring the sustainable use of our water resources,
- strengthening decision support capability, and
- enhancing the commercial and recreational value of our waterways.

[7] "Brownfields" are properties with real or perceived environmental contamination that hampers redevelopment efforts.

[8] See U.S. Policy Committee, *Great Lakes Strategy 2002*, (p.3), (Feb. 22, 2002).

For each goal, the strategy contains recommendations for actions that target specific programs, authorizations, and appropriations. For example, the commission helped develop and promote the adoption of an action plan for the prevention and control of aquatic nuisance species.

The commission's strategy involves coordinated efforts among the commission and its partner agencies and organizations to secure much needed federal appropriations and legislative initiatives. This strategy emphasizes federal/state and U.S./Canadian partnerships as a means to achieving its goals, but it does not provide detailed implementation plans or identify funding sources to achieve the goals. GLNPO officials stated that they believe this strategy and the *Great Lakes Strategy 2002* are complimentary rather than competing strategies.

Two other organizations—Great Lakes United and the Council of Great Lakes Governors—are developing basin-wide restoration strategies. Great Lakes United, an international coalition of basin stakeholders, has developed and circulated several documents addressing Great Lakes issues. By 2003, Great Lakes United plans to integrate these draft issue documents into an overall agenda for the comprehensive restoration of the basin. The Council of Great Lakes Governors' strategy is being based on the priorities of the Great Lakes governors and is to be used as a basis for identifying priority restoration efforts for the basin.

Additional Strategies Focus on Specific Issues or Geographic Areas

Other Great Lakes specific strategies address unique environmental problems or specific geographical areas. A strategy for each lake addresses open lake waters through Lakewide Management Plans (LaMP), which EPA is responsible for developing. Toward this end, EPA formed working groups for each lake to identify and address restoration activities. For example, the LaMP for Lake Michigan, issued in 2002, includes a summary of the lake's ecosystem status and addresses progress in achieving the goals described in the previous plan, with examples of significant activities completed and other relevant topics.

The Binational Executive Committee for the United States and Canada issued its *Great Lakes Binational Toxics Strategy* in 1997 that established a collaborative process by which EPA and Environment Canada, in consultation with other federal departments and agencies, states, the province of Ontario, and tribes, work toward the goal of the virtual elimination of persistent toxic substances in the Great Lakes. The strategy particularly addresses substances that bioaccumulate in fish or animals and pose a human health risk. After establishing various challenges for

both or either country to meet, the strategy lays out priority activities to meet the challenges. The strategy also incorporates the regular assessment of progress made. Among the successes in reducing persistent toxic substances in the Great Lakes is the cleanup of contaminated sediment sites at some Great Lakes harbors; reduced levels of PCBs, dioxins, and DDT; and improved sport fisheries.

Michigan developed a strategy for environmental cleanup called the *Clean Michigan Initiative*. This initiative provides money for a variety of environmental, parks, and redevelopment programs. It includes nine components, including Brownfields redevelopment and environmental cleanups, nonpoint source pollution control, clean water, cleanup of contaminated sediments, and pollution prevention. The initiative is funded by a $675 million general obligation bond and as of early 2003, most of the funds had not been distributed.

GLNPO Has Not Fully Exercised Its Authority for Coordinating Great Lakes Restoration Programs

Ultimate responsibility for coordinating Great Lakes restoration programs rests with GLNPO, which has the statutory authority to coordinate EPA's and other federal agency activities. However, GLNPO has not fully exercised this authority, and other organizations or committees have formed to assume coordination and strategy development roles.

The Clean Water Act provides GLNPO with the authority to coordinate the actions of EPA's headquarters and regional offices aimed at improving Great Lakes water quality. It also provides GLNPO with the authority to coordinate EPA's actions with the actions of other federal agencies and state and local authorities for obtaining input in developing water quality strategies and obtaining support in achieving the objectives of the GLWQA. Finally, the statute provides that the EPA Administrator shall ensure that GLNPO enters into agreements with the various organizational elements of the agency engaged in Great Lakes activities and with appropriate state agencies. The agreements should specifically delineate the duties and responsibilities, time periods for carrying out duties, and resources committed to these duties. GLNPO officials stated that they do not enter into formal agreements with other EPA offices but rather fulfill their responsibilities under the act by having federal agencies and state officials agree to the restoration activities contained in the *Great Lakes Strategy 2002*. However, the strategy does not represent formal agreements to conduct specific duties and responsibilities with committed

resources. The absence of these agreements was also reported in a September 1999 report by EPA's Office of Inspector General.[8] The report stated that GLNPO did not have agreements as required by the act and recommended that such agreements be made to improve working relationships and coordination.

Other organizations or groups have formed to fulfill coordinating roles in Great Lakes restoration activities, both at the basin level and on a smaller scale for specific issues of concern. For example, the USPC, which was formed initially by GLNPO in 1988 to develop a Great Lakes strategy and provide a coordinating role, developed a strategy and a coordinating plan, "Protecting the Great Lakes," in 1992 to cover the 5-year period from 1992 through 1997. Officials from federal agencies not on the USPC never approved the plan, and many parties involved in environmental activities in the basin felt left out of the strategy development process. The USPC was disbanded in 1995, and the strategy was not used as a guide for restoration activities. GLNPO officials formed a second U.S. Policy Committee in 1999, similar in structure to the first committee, which included federal regional and state officials. The USPC recently developed the *Great Lakes Strategy 2002*, and it meets semi-annually to coordinate agency actions and commitments associated with the strategy, as well as to review progress and ensure accountability. Another group, the Midwest Natural Resources Group, established in 1998, contains a Great Lakes focus team that conducts coordination meetings for eliminating duplication across federal bureaus and agencies. Within this group, representatives from EPA and the Corps facilitate activities, such as developing monitoring protocols, sharing facilities and vessels across agencies, and increasing data sharing.

With several entities involved in coordinating, planning, and strategizing, it appears at times that federal and state officials cannot be sure which entity bears ultimate responsibility for and authority over these activities and their implementation at any given time and whether the entity is a permanent body or an ad hoc organization that may disband if interest wanes. State of Minnesota officials, who were asked to provide input for several restoration plans, stated that they found the significant overlap of the plans inefficient and thought it would be helpful to have a more streamlined approach to Great Lakes issues. They stated that it would be

[8] See U.S. Environmental Protection Agency, *EPA's Great Lakes Program*, EPA/OIG Rept. 99P00212 (Washington, D.C.: Sept. 1, 1999).

better to have an overall structure to carry out environmental activities. Officials from The Nature Conservancy, a nonprofit organization conducting environmental activities in the Great Lakes, stated that it is difficult to understand the array of public sector entities and their involvement in Great Lakes issues. They observed that the Great Lakes community is fractionalized with participants, both public and private, pushing their own agendas rather than a true vision vetted with all stakeholders. They further noted that the heavy bureaucratic framework of many groups and processes made them skeptical that actual work would be conducted.

A USGS official stated that the lack of a unified vision among the many Great Lakes federal, state, and local agencies impedes progress. He noted that individual efforts are not structured or organized in such a way that they can be integrated to provide the hierarchical means to assess, diagnose, and restore the system. The burden to provide the leadership that will bring a Great Lakes program to a level that is consistent with other large-scale efforts, such as the Chesapeake Bay restoration, rests largely with EPA–the only agency under the Clean Water Act and associated agreements with Canada–with regulatory authority to do so. More money, the official said, would not improve restoration progress unless it is combined with a strong, overarching effort of coordination and organization. GLNPO officials stated that the success of the Chesapeake Bay Watershed Restoration Project can be attributed to the buy-in of high-level officials, such as the governors of the related states, a level of influential support that they say GLNPO lacks.

While several organizations are conducting coordination in developing strategies, at the individual program level, most federal and state officials reported coordination with their programmatic counterparts in various ways while implementing their programs. For example, section 404 of the Clean Water Act requires a formal arrangement between EPA and the Corps to coordinate management of a dredge and fill permit program each year, with the agencies jointly reviewing about 10,000 permit applications for the basin. Coordination activities can be formalized in memoranda of understanding or agreement, interagency agreements, or letters of collaboration. For example, in a 1997 memorandum of agreement among NOAA, EPA, the Wisconsin Department of Natural Resources, and two Wisconsin Indian tribes, the parties agreed to coordinate their efforts in removing contaminated sediments from the Lower Fox River in Wisconsin. The agreement specifies an organizational structure, including what the parties' duties are, what their responsibilities are, and how disputes will be resolved. In addition to such formal coordination,

informal coordination also occurs between federal and state officials through meetings or telephone calls. For example, officials from EPA's Region V Water Division coordinated Coastal Environmental Management Program activities with eight federal agencies in developing LaMPs. This coordination included correspondence, conference calls, and various face-to-face meetings.

Major Planning Efforts Have Not Yielded Extensive Restoration Activity because of a Lack of Funding and Other Barriers

Although major planning efforts aimed at restoring the Great Lakes exist, several barriers have prevented these efforts from resulting in extensive restoration activity. Great Lakes program officials often cited insufficient funding for program activities as a major barrier and a reason for not achieving and measuring restoration progress in the Great Lakes. They also cited several other factors affecting progress, including the lack of local technical expertise for conducting restoration activities, poor coordination among groups conducting environmental activity, and a lack of leadership.

Limited Restoration Progress after Many Years of Planning

After years of planning restoration activities for the Great Lakes Basin, significant restoration progress remains to be achieved. Several IJC reports have pointed out the slow restoration progress. For example, in 2002, the IJC reported that after more than 15 years of planning and incremental activity, restoration of the Great Lakes through remedial actions remains elusive and difficult and more needs to be done quickly.[10] Moreover, the IJC stated in 2000 that the Great Lakes ecosystem remains compromised and that contaminated sediments in the lakes produce health problems.[11] Restoration challenges remain in several areas, such as controlling invasive species.

The slow restoration progress is illustrated by the 26 contaminated areas in the Great Lakes Basin for which the United States is responsible for ensuring cleanup under the GLWQA. In April 2002, we reported that none of the areas had been restored to beneficial use and only half of the areas selected remedial and regulatory measures to address the problems, and

[10] See IJC, *11th Biennial Report on Great Lakes Water Quality*, (Sept. 12, 2002).

[11] International Joint Commission, *Tenth Biennial Report on Great Lakes Water Quality*, (June 29, 2000).

all areas had defined their respective environmental problems.[12] The slow progress of cleanup efforts reflects a general departure from the process specified in the agreement, and in some cases the process was abandoned. Based on these findings, it was clear that EPA was not fulfilling its responsibility to ensure that plans for cleaning up the areas were being developed or implemented. Citing resource constraints along with the need to tend to other Great Lakes priorities, EPA reduced its staff and the amount of funding it allocated to states for developing and implementing plans for contaminated areas. Subsequent to our report, GLNPO officials took actions to improve the implementation of cleanup plans.

Lack of Funding Is a Key Barrier to Achieving Restoration Progress

Inadequate funding has also contributed to the failure to restore and protect the Great Lakes, according to the IJC biennial report on Great Lakes water quality issued in July 2000.[13] The IJC restated this conclusion in a 2002 report, concluding that any progress to restore the Great Lakes would continue at a slow incremental pace without increased funding.[14] Lack of funding is consistently mentioned in prior IJC reports as a major roadblock to restoration progress. For example, the 1993 biennial report concluded that remediation of contaminated areas could not be accomplished unless government officials came to grips with the magnitude of cleanup costs and started the process of securing the necessary resources.[15] Despite this warning, however, as we reported in 2002, EPA reduced the funding available for ensuring the cleanup of contaminated areas under the assumption that the states would fill the funding void. States, however, did not increase their funding, and restoration progress slowed or stopped altogether.[16]

Officials for 24 of 33 federal programs and for 3 of 17 state programs reported insufficient funding for federal and state Great Lakes specific programs. They cited specific consequences of funding deficits, including:

[12] See U.S. General Accounting Office, *Great Lakes: EPA Needs to Define Organizational Responsibilities Better for Effective Oversight and Cleanup of Contaminated Areas*, GAO-02-563 (Washington, D.C.: May 17, 2002).

[13] See IJC, *Tenth Biennial Report on Great Lakes Water Quality*, (June 29, 2000).

[14] See IJC, *11th Biennial Report on Great Lakes Water Quality*, (Sept. 12, 2002).

[15] See IJC, *Seventh Biennial Report on Great Lakes Water Quality*, (Dec. 15, 1993).

[16] See GAO-02-563, cited on p. 53, footnote 12.

- Funding for GLNPO's monitoring programs has not kept pace with increased operating costs, allowed for infrastructure repairs for its research vessel, provided for sufficient atmospheric deposition monitoring, or provided for monitoring new or emerging contaminants.

- Michigan's Great Lakes Protection Fund receives funding requests exceeding the amount of money that is available in any given year. For example, in fiscal year 2001, the state received requests for $10.4 million for project funding and was able to fund projects totaling only $700,000.

States are particularly strapped to provide funding for restoration activities within recent budget constraints. For example, an official with the Michigan Department of Environmental Quality stated that the priority for funding an unmandated Great Lakes program is secondary to other programs specifically mandated by the Clean Water and Clean Air Acts and other environmental programs. An official from the Minnesota Pollution Control Agency stated that Minnesota and other states do not routinely set aside funds to implement restoration activities for the Great Lakes. Restoration projects are funded within the constraints of the states' current budgets, and existing funding requirements take precedent. State officials also pointed out the difficulty states face in providing funds to meet federal program matching fund requirements for restoration activities. Although the matching fund percentage required may be relatively low, such as 10 percent, the aggregate amount for several programs can be significant. For example, Michigan Department of Environmental Quality officials informed us that during fiscal years 1992 through 2001, the state expended over $83 million in matching funds to obtain federal funding for programs that contributed to restoration or protection in the basin. During this same period, Ohio's environmental programs expended more than $14 million in matching fund amounts. Corps and other federal officials stated that some states do not solicit federal program funds because they lack the ability to meet the matching fund requirements.

Other Significant Barriers Exist for Restoration Progress

While the lack of funding is the most often cited barrier to restoration progress, other factors, such as lack of technical expertise and effective coordination, also create barriers to restoration progress. A NOAA official stated that while financial resource limitations hinder the restoration process, increased funding without better coordination among the various agencies would not be effective. In a similar observation, a Minnesota state official said that there is no agency at the federal or state level that

knows all the programs and funding that exist to address Great Lakes problems or the steps one must take to obtain these funds. The official further commented that a significant lack of technical knowledge within program management for many Great Lakes projects prevents agencies from identifying and assessing environmental needs and measuring restoration progress. In commenting on efforts to cleanup contaminated areas in the Great Lakes, the IJC reported several other problems besides the lack of funding for cleanup sites, namely the lack of government leadership and accountability, delays caused by disagreements, and inadequate planning.

Conclusions

Although there are several strategies that address restoration of the Great Lakes Basin, no one overarching strategy or plan unifies these strategies in the pursuit of a common goal, similar to the restoration plan for the South Florida ecosystem. The magnitude of the restoration effort and the number of parties involved in the basin restoration necessitate that the major parties involved develop and agree upon an overarching strategy that addresses basin improvements. Without such an overall strategy or plan, there is no road map to follow for achieving the restoration goals agreed to between the United States and Canada in the GLWQA. An overarching strategy for the basin is needed to establish restoration goals, outline how restoration will occur, identify the resources needed to achieve restoration, assign accountability for restoration, and provide a mechanism for measuring progress for achieving goals. While there is a general consensus that more funding is needed for the restoration, without an overall strategy that prioritizes activities, it is unclear which activities should receive additional funding. Furthermore, without a strategy, the cycle of preparing numerous plans without significant restoration progress will likely continue. Although GLNPO is responsible for coordinating U.S. restoration activities within the basin, EPA has not ensured that GLNPO fulfills this responsibility by entering into agreements for conducting restoration activities.

Recommendations for Executive Action

To improve coordination of Great Lakes activities and ensure that federal dollars are effectively spent, we recommend that the Administrator, EPA,

- ensure that GLNPO fulfills its responsibility for coordinating programs within the Great Lakes Basin;
- charge GLNPO with developing, in consultation with the governors of the Great Lakes states, federal agencies, and other organizations, an

overarching strategy that clearly defines the roles and responsibilities for coordinating and prioritizing funding for projects; and
- submit a time-phased funding requirement proposal to the Congress necessary to implement the strategy.

Agency Comments

While EPA stated that it agreed with the need for better coordination and that our recommendations can help ensure that environmental improvements are made, it did not address the specific recommendations to improve coordination of Great Lakes activities. Rather, the agency stated it would provide to our agency, the Congress, and the Office of Management and Budget a formal response to the final report recommendations. The agency stated that it fulfilled its coordination responsibilities by convening the USPC and developing the *Great Lakes Strategy 2002*. We recognized these efforts in our report, but they do not fulfill GLNPO's responsibility for coordinating programs in the Great Lakes Basin, nor does the strategy fulfill the need for an overarching strategy for the basin. EPA does acknowledge that its strategy can be used as a foundation for any future Great Lakes ecosystem restoration plan. The complete text of EPA's comments is presented in appendix V.

Chapter 4: Insufficient Data and Measures Make It Difficult to Determine Overall Restoration Progress

The Great Lakes Water Quality Agreement (GLWQA) calls for a monitoring system to measure restoration progress and ensure that its objectives are met. To date, the implementation of this provision has been limited. While there is recognizable progress in improving some environmental conditions in the Great Lakes Basin, current environmental indicators do not provide an adequate basis for determining overall progress. Recent assessments of overall progress have relied on a mix of quantitative data and subjective judgments, and progress reported on federal and state programs focuses on program activities, frequently citing outputs rather than environmental outcomes. A binational effort to develop a set of overall indicators was initiated in 1996, but the completion date for this effort and the availability of resources needed to gather baseline indicators data are uncertain.

The Great Lakes Water Quality Agreement Calls for a Monitoring System to Ensure Objectives Are Met

One of the 17 agreement annexes in the GLWQA, as amended in 1987, requires that the United States and Canada undertake a joint surveillance and monitoring program to measure restoration progress and assess the degree to which the parties are complying with goals and objectives of the agreement. The program also provides for an evaluation of water quality trends, identification of emerging problems, and support for developing remedial action plans for contaminated areas and lakewide management plans for critical pollutants. Prior to the 1987 amendments, the 1978 agreement between the two countries also contained a requirement for surveillance and monitoring and for the development of a Great Lakes International Surveillance Plan. The IJC Water Quality Board was involved in managing and developing the program until the 1987 amendments placed this responsibility on the United States and Canada. According to a binational review of the agreement in 1999, this change resulted in a significant reduction in the two countries' support for surveillance and monitoring. In fact, the organizational structure to implement the surveillance plan was abandoned in 1990, leaving only one initiative in place—the International Atmospheric Deposition Network (IADN). In 1990, the two countries initiated IADN—a network of 15 air-monitoring stations located throughout the basin.

With the surveillance and monitoring efforts languishing, the IJC established the Indicators for Evaluation Task Force in 1993 to identify the appropriate framework to evaluate progress in the Great Lakes. As the entity responsible for evaluating progress towards meeting the goals and objectives of the agreement, the IJC task force, in 1996, proposed that the following nine desired measurements and outcomes be used to develop indicators for measuring progress (see table 4).

Table 4: Desired Measurements and Outcomes for Great Lakes Indicators

Measurement	Desired outcome
Fishability	No restrictions on the human consumption of fish resulting from the input of persistent toxic substances.
Swimmability	No public beaches closed or swimming restrictions imposed because of human activities.
Drinkability	Treated drinking water is safe for human consumption, and there are no restrictions because of human activities.
Healthy human populations	Human populations in the Great Lakes Basin are healthy and free from acute illness because of exposure to high levels of contaminants or chronic illness because of exposure to low level contaminants.
Economic viability	The regional economy is viable and sustainable and provides adequate sustenance and dignity for the basin population.
Biological community integrity and diversity	The ability of biological communities to function normally in the absence of environmental stress by maintaining ecosystem health, ecological integrity, and the diversity of biological communities.
Virtual elimination of inputs of persistent toxic substances	The virtual elimination of inputs of persistent toxic substances into the Great Lakes.
Absence of excess phosphorus	The absence of excess phosphorus entering the watersheds because of human behavior.
Physical environment integrity	The development, compatible use, and maintenance of aquatic habitat in the quantity and quality necessary and sufficient to sustain an endemic assemblage of fish and wildlife populations.

Source: IJC.

Shortly before the task force began its work, the United States and Canada had agreed to hold conferences every 2 years to assess the environmental conditions in the Great Lakes in order to develop binational reports on the environmental conditions to measure progress under the agreement. Conference participants included U.S. and Canadian representatives from federal, state, provincial, and tribal agencies, as well as other organizations with environmental restoration or pollution prevention interests in the Great Lakes Basin. The first State of the Lakes Ecosystem Conference (SOLEC)[17] was held in 1994 and culminated in a "State of the Great Lakes 1995" report, which provided an overview of the Great Lakes ecosystem at the end of 1994 and concluded that overall the aquatic community health was mixed or improving. The same assessment was echoed in the 1997 state of the lakes report. Meanwhile, the IJC agreed that monitoring the

[17] SOLEC is co-chaired by representatives from the U.S. EPA and Environment Canada.

nine desired outcome areas recommended by the task force would help assess overall progress. It recommended that SOLEC, during the conference in 2000, establish environmental indicators that would allow the IJC to evaluate what had been accomplished and what needed to be done as it relates to the public's ability to eat the fish, drink the water, and swim in the water without any restrictions. The other outcomes would be addressed at a later date.

Current Indicators Do Not Provide an Adequate Basis for Making an Overall Assessment of Restoration Progress

The indicators developed through the SOLEC process and the accomplishments reported by federal and state program managers do not provide an adequate basis for making an overall assessment for Great Lakes restoration progress. The SOLEC process is ongoing, and the indicators that are still being developed are not generally supported by sufficient underlying data for making progress assessments. The ultimate success of SOLEC is uncertain because of limited resources committed to the process, and until indicators are finalized, the accomplishments now reported for individual Great Lakes specific programs do not provide an adequate basis for assessing overall progress. Program accomplishments usually describe program outputs, rather than outcomes, and do not adequately portray whether environmental conditions are improving or deteriorating.

Recent Assessments of Environmental Conditions Rely on Limited Data

SOLEC's recent assessments of the Great Lakes ecosystem have relied on limited quantitative data and subjective judgments in determining the status of desired outcomes, such as swimmability, drinkability, and the edibility of fish within the Great Lakes. At the 1998 SOLEC conference, groups of experts narrowed down a list of more than 850 indicators to 80 basin ecosystem indicators with the objective of reaching an agreement on a list of comprehensive indicators for the basin. The proposed indicators were reviewed, discussed, and revised during the conference and placed in seven categories, such as open waters, coastal wetlands, land use, and human health. Within these categories, the indicators were further classified as a current condition (state), such as population of salmon and trout, or an adverse impact (pressure), such as sea lamprey diminishing fish populations. Conference participants devoted extensive effort to commenting on and modifying these indicators.

The SOLEC 2000 conference focused on assessing the previously identified 80 indicators for reporting on the overall condition of the Great Lakes. Participants further reduced the number of indicators ultimately assessed because data was only readily available for 33 indicators. Subject

experts assessed and classified the indicators on a scale with five classifications—good; mixed, improving; mixed; mixed, deteriorating; and poor. Participants developed these classifications using the following definitions:

- Good. The state of the ecosystem component is presently meeting ecosystem objectives or otherwise is an acceptable condition.
- Mixed, improving. The ecosystem component displays both good and degraded features, but overall, conditions are improving toward an acceptable state.
- Mixed. The state of the ecosystem component has some features that are in good condition and some features that are degraded, perhaps different between lake basins.
- Mixed, deteriorating. The ecosystem component displays both good and degraded features, but overall, conditions are deteriorating from an acceptable state.
- Poor. The ecosystem component is severely negatively impacted and does not display even minimally acceptable conditions.

For example, the level of contaminants in snapping turtle eggs is an indicator for coastal wetlands. The indicator was assessed and placed in the mixed assessment category because of the high levels of contaminants in snapping turtle eggs found at eight locations in Lakes Ontario and Erie, and the St. Lawrence River. The classification of indicators into categories was based on the SOLEC partners' best professional judgments and was not necessarily supported by sound science-based reliable data. The 33 indicators became the basis for the "State of the Great Lakes 2001" report, which concluded that a detailed quantitative assessment could not be made, but that an overall qualitative assessment of "mixed" should be applied to the basin ecosystem. The assessment was based on six observations. One positive observation was that the Great Lakes surface waters remain one of the best drinking water sources in the world; a negative observation was that invasive species continue to present a significant threat to the biological community.

After the SOLEC 2000 conference, IJC staff assessed the indicators supported by data that measured the desired outcomes of swimmability,

drinkability, and the edibility of fish in the Great Lakes.[18] Overall, the IJC commended SOLEC's quick response that brought together information regarding the outcomes and SOLEC's ongoing efforts. The IJC, however, recognized that sufficient data were not being collected from around the Great Lakes and that the methods of collection, the data collection time frames, the lack of uniform protocols, and the incompatible nature of some data jeopardized their use as indicators. Specifically, for the desired outcome of swimmability, which was assessed as "mixed," the IJC concurred that it was not always safe to swim at certain beaches but noted that progress for this desired outcome was limited because beaches were sampled by local jurisdictions without uniform sampling or reporting methods. At the 2002 SOLEC conference, the number of indicators assessed under the 5-tiered scale increased from 33 to 45. The IJC expressed concern that there are too many indicators, insufficient supporting backup data, and a lack of commitment and funding from EPA to implement and make operational the agreed upon SOLEC baseline data collection and monitoring techniques. The IJC recommended in its last biennial report that any new indicators should be developed only where resources are sufficient to access scientifically valid and reliable information.

Successful Development and Assessment of Indicators Are Difficult to Discern

The ultimate successful development and assessment of indicators for the Great Lakes through the SOLEC process are uncertain because insufficient resources have been committed to the process, no plan provides completion dates for indicator development and implementation, and there is a lack of control over the data being collected. While the SOLEC process has successfully engaged a wide range of binational parties in developing indicators, the resources devoted to this process are largely provided on a volunteer basis without firm commitments to continue in the future. GLNPO officials described the SOLEC process as a professional, collaborative process dependent on the voluntary participation of officials from federal and state agencies, academic institutions, and other organizations attending SOLEC and developing information on specific indicators. The resources provided for the process cannot be assured in the future and the financial resources committed by GLNPO to the process have primarily consisted of contributing funding for hosting the conferences and providing two staff members to manage the process. EPA supports the development of environmental indicators as

[18] See IJC, *11th Biennial Report on Great Lakes Water Quality*, (Sept. 12, 2002).

evidenced by the fact that, since 1994, GLNPO has provided about $100,000 annually to sponsor the conferences.

Additionally, GLNPO spends over $4 million per year to collect surveillance data for its open-lake water quality monitoring program, which also provides supporting data for some of the indicators addressed by SOLEC. A significant portion of these funds supports the operation of GLNPO's research vessel, the Lake Guardian, an offshore supply vessel converted for use as a research vessel. GLNPO also supports activities that are linked or otherwise feed information into the SOLEC process, including the following:

- collecting information on plankton and benthic communities in the Great Lakes for open water indicator development;
- sampling various chemicals in the open-lake waters, such as phosphorus for the total phosphorus indicator;
- monitoring fish contaminants in the open waters, directly supporting the indicator for contaminants in whole fish and a separate monitoring effort for contaminants in popular sport fish species that supports the indicator for chemical contaminants in edible fish tissue; and
- operating 15 air-monitoring stations with Environment Canada comprising the IADN that provides information for establishing trends in concentrations of certain chemicals and loadings of chemicals into the lakes. EPA uses information from the network to take actions to control the chemicals and track progress toward environmental goals.

Because SOLEC is a voluntary process, the indicator data resides in a diverse number of sources with limited control by SOLEC organizers. GLNPO officials stated that EPA does not have either the authority or the responsibility to direct the data collection activities of federal, state, and local agencies as they relate to surveillance and monitoring of technical data elements that are needed to develop, implement, and assess Great Lakes environmental indicators. They further stated that the current SOLEC indicator process is based on unofficial professional relationships established between the SOLEC partnerships. Efforts are underway for the various federal and state agencies to take ownership for collecting and reporting data outputs from their respective areas of responsibility and for SOLEC to be sustained and implemented; each indicator must have a sponsor. However, any breakdown in submission of this information would leave a gap in the SOLEC indicator process.

SOLEC's 10-year plan, as presented at the 2000 conference, describes its objectives and the planned conference themes through 2006 with the

theme for 2008 and beyond yet to be determined. Its stated objectives are to

- assess the state of the Great Lakes ecosystem based on accepted indicators,
- strengthen decision making and management,
- inform local decision makers of Great Lakes environmental issues, and
- provide a forum for communication and networking among stakeholders.

Three of the SOLEC objectives do not focus directly on developing indicators, nor do the stated objectives align with the surveillance and monitoring program envisioned in the GLWQA. Whereas the agreement called for a joint surveillance and monitoring program to assess compliance with the agreement, evaluating water quality trends, identification of emerging problems, and support for the development of Remedial Action Plans and Lakewide Management Plans, the achievements reported for the SOLEC process, which include the number of background papers produced and reports prepared on the state of the lakes, do not align with the expected results envisioned by the surveillance and monitoring program.

In November 2001, EPA committed to an agencywide initiative to develop environmental indicators for addressing the agency's nationwide environmental conditions, stating that "indicators help measure the state of our air, water and land resources and the pressures placed on them, and the resulting effects on ecological and human health." However, this initiative does not specifically relate to the Great Lakes. The short-term goal for this initiative is to develop information that will indicate current nationwide environmental conditions and to help EPA make sound decisions on what needs to be done. The long-term goal is to bring together national, regional, state, and tribal indicator efforts to describe the condition of critical environmental areas and human health concerns.

Federal and State Programs Measure Progress in Several Ways, Often Citing Outputs Rather than Outcomes

Progress reported by officials from individual federal and state programs in the basin is generally not presented in a manner that describes how the programs have improved environmental conditions within the Great Lakes Basin. Program output data are frequently cited as measures of success versus actual program accomplishments. As a rule, program output data describe activities, such as projects funded, and are of limited value in determining environmental progress. For example, accomplishments reported for Michigan's Great Lakes Protection Fund were that it funded

125 research projects over an 11-year period and publicized its project results at an annual forum and on a Web site. Another example is the Lake Ontario Atlantic Salmon Reintroduction Program administered by FWS. Under its accomplishments, program officials cited the completion of a pilot study and technical assistance provided to a Native American tribe. For the 50 federal and state programs created specifically to address conditions in the basin, 27 reported accomplishments in terms of outputs, such as reports or studies prepared or presentations made to groups. Because research and capacity building programs largely support other activities, it is particularly difficult to relate reported program accomplishments to outcomes. For example, the National Oceanic Atmospheric Administration's Great Lakes Environmental Research Laboratory conducts extensive research and environmental modeling that helps to improve management of aquatic environments and understanding of coastal and estuarine processes. The federal and state environmental program officials responding to our evaluation generally provided output data or, as reported for 15 programs, the accomplishments had not been measured for these Great Lakes specific programs.

Only eight of the federal or state Great Lakes specific programs reported outcome information, much of which generally described how effective the programs' activity or action had been in improving environmental conditions. For example, EPA's Region II program for reducing toxic chemical inputs into the Niagara River, which connects Lake Erie to Lake Ontario, reported reductions in priority toxics from 1986 through 2002 from ambient water quality monitoring. Other significant outcomes reported as accomplishments for the Great Lakes included (1) reducing phosphorus loadings by waste treatment plants and limiting phosphorus use in household detergents; (2) prohibiting the release of some toxicants into the Great Lakes, and reducing to an acceptable level the amount of some other toxicants that could be input; (3) effectively reducing the sea lamprey population in several invasive species infested watersheds; and (4) restocking the fish-depleted populations in some watersheds.

Conclusions

Without a monitoring system for the Great Lakes Basin, it is impossible to determine overall restoration progress and compliance with goals and objectives of the GLWQA. While it is clear that some restoration progress has occurred for some environmental conditions, definitive observations on overall restoration progress are difficult to make without indicators to measure progress, baseline indicator data, and a process for monitoring indicators. The current SOLEC process fills an important void, but it cannot fulfill the requirements of the surveillance and monitoring program

called for in the agreement. SOLEC serves a useful purpose in creating a consensus on which indicators are the most useful and inventorying available indicator data. There is no assurance, however, that the SOLEC process, which relies heavily on the voluntary participation of interested officials, will continue, or if it does continue, whether it will yield sufficient information for an overall quantitative assessment of the Great Lakes ecosystem.

Recommendations for Executive Action

To fulfill the need for a monitoring system called for in the GLWQA and to ensure that the limited funds available are optimally spent, we are recommending that the Administrator, EPA, in coordination with Canadian officials and as part of an overarching Great Lakes strategy, (1) develop environmental indicators and a monitoring system for the Great Lakes Basin that can be used to measure overall restoration progress and (2) require that these indicators be used to evaluate, prioritize, and make funding decisions on the merits of alternative restoration projects.

Agency Comments

EPA stated that it agreed with the need for better monitoring and generally agreed that our recommendations can help ensure improvements. However, it did not address the specific recommendations for a monitoring system called for in the Great Lakes Water Quality Agreement. Rather, the agency stated it would provide to our agency, the Congress, and the Office of Management and Budget a formal response to the final report recommendations. EPA stated that GLNPO has supported the SOLEC effort, but it did not comment on the recommendations for developing indicators and a monitoring system to measure overall restoration progress. The complete text of EPA's comments is presented in appendix V.

Appendix I: Federal and State Agencies That Provided Great Lakes Program Information

Federal agencies

Environmental Protection Agency

- Great Lakes National Program Office
- Office of Research and Development
- Regions II, III, and V

Department of Agriculture

- Agricultural Research Service
- Cooperative State Research, Education, and Extension Service
- Farm Services Agency
- Forest Service
- Natural Resource Conservation Service

Department of Commerce

- National Oceanic and Atmospheric Administration

Department of Defense

- U.S. Army Corps of Engineers

Department of Health and Human Services

- Agency for Toxic Substances and Disease Registry

Department of Homeland Security

- U.S. Coast Guard

Department of Interior

- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- National Park Service

State agencies

Illinois

- Illinois Environmental Protection Agency

Indiana

- Indiana Department of Natural Resources

Ohio

- Ohio Environmental Protection Agency
- Ohio Department of Natural Resources

Michigan

- Michigan Department of Environmental Quality
- Michigan Department of Natural Resources

Minnesota

- Minnesota Department of Commerce
- Minnesota Pollution Control Agency
- Minnesota Department of Natural Resources
- Minnesota Board of Water and Soil Resources
- Minnesota State Planning Agency

New York

- New York Department of Environmental Conservation

Pennsylvania

- Pennsylvania Department of Environmental Protection

Wisconsin

- Wisconsin Department of Natural Resources

Appendix II: Federal and State Non-Great Lakes Specific Programs, Fiscal Years 1992 through 2001

Table 5 contains a listing of the non-Great Lakes specific programs managed by federal agencies.

Table 5: Federal Non-Great Lakes Specific Programs

Program name	Purpose	Program expenditures (1992-2001)[a]
Army Corps of Engineers		
Aquatic Ecosystem Restoration	This restoration program funds the planning, design, and construction of projects to restore and enhance aquatic ecosystems. Program activities began in 1998.	$2,243,800[b]
Beneficial Use of Dredged Material	This program, which was established in 1992, funds the planning, design, and construction of projects to protect, restore, and enhance aquatic habitats using sediments dredged from federal navigation projects. It is classified as a restoration program.	$384,600[c]
Cleaning and Snagging	Originally created in 1954, the purpose of this program is to plan, design, and construct projects for emergency removal of debris that threatens to aggravate damage caused by flooding.	$4,000
Confined Disposal Facilities	This cleanup program was established in 1970. Its purpose is to design, construct, and operate confined disposal facilities for the disposal of contaminated dredged materials from federal navigation projects.	$72,696,140
Emergency Stream Bank and Shoreline Protection	This program was created in 1946 and its purpose is to plan, design, and construct projects to protect public facilities and services from stream bank and shoreline erosion.	$8,086,400
Environmental Dredging	This environmental cleanup program was created in 1990. The program's purpose is to assist in the planning, design, and construction of projects to remove contaminated sediments from areas outside federal navigation channels.	$670,700[b]
Environmental Improvements	The purpose of this restoration program, which was started in 1986, is to plan, design, and construct projects to restore and enhance aquatic ecosystems at sites impacted by Corps projects.	$13,016,400[d]
Flood Plain Management Services	Created in 1960, this program provides flood plain information and technical assistance to states and local communities.	$4,784,500
Planning Assistance to States	This program was created in 1974, and its purpose is to provide staff and financial assistance to states in planning for the use, development, and conservation of water resources.	$3,123,500
Shore Protection	The purpose of this restoration program, created in 1962, is to plan, design, and construct projects to restore and protect shores against waves and currents.	$1,038,000
Small Flood Control Projects	This program, which was created in 1948, funds activities related to the planning, design, and construction of projects to reduce flood damages.	$11,375,100
Small Navigation Projects	Created in 1960, the purpose of this program is to plan, design, and construct projects to improve navigation.	$7,871,000
Tribal Partnership Program	This program was started in 2000, and it seeks to provide tribal groups with assistance in planning for the use, development, and conservation of water resources.	[e]
Department of Agriculture-Agricultural Research Service (ARS)		
Agricultural Research Service Research Units	This research and pollution prevention program started in 1990 to develop agricultural best management practices, including water management strategies for corn and soybean production systems, and to assess the impact of these practices on field, farm, and watershed scales.	$2,293,700

Program name	Purpose	Program expenditures (1992-2001)[a]
Department of Agriculture-Cooperative State Research, Education, and Extension Service (CSREES)		
Hatch Act Research Program	This research program was started in the late 1800s to promote efficient production, marketing, distribution, and utilization of crops and livestock essential to the food supply and health and welfare of the American people, while conserving resources and improving rural living conditions.	$4,582,000[c]
Integrated Activities Program	This program supports integrated research, education, and extension on critical agricultural issues. Program activities began in 2000.	$11,081,000[c]
McIntire-Stennis Cooperative Forestry Research Program	The purpose of the program, which began in 1962, is to support research essential to the efficient and effective use of the nation's forest resources.	$140,000[c]
National Research Initiative Program	This program provides support for research with the greatest potential of expanding the knowledge base needed to solve current problems and unforeseen issues involving the future agricultural and forestry enterprise. The program was created in 1965 and activities began in 1991.	$433,000[c]
Small Business Innovation Research Program	The purpose of this program, which began in 1986, is to strengthen the role of small, innovative firms in federally funded research and development activities.	$383,000[c]
Special Research Grants Program	This program was created in 1965 to fund research on problems of national, regional, and local interest that fall beyond the normal emphasis of the formula programs.	$1,675,000[c]
Department of Agriculture-Farm Services Agency (FSA)		
Conservation Reserve Program	This voluntary restoration and conservation program for agricultural landowners was created in 1985. Through this program, landowners receive annual rental payments and cost-share assistance to establish long-term, resource conserving vegetative covers on eligible farmland.	$540,718,000
Emergency Conservation Program	This program provides emergency funding for farmers and ranchers to rehabilitate farmland damaged by wind erosion, floods, hurricanes, or other natural disasters and for carrying out emergency water conservation measures during periods of severe drought. This restoration program began in 1978.	$4,670,000
Department of Agriculture-Forest Service (FS)		
Atmospheric Ecosystem Interactions at Multiple Scales	This research program, which began in 1996, focuses on air quality in the western Great Lakes. The program examines factors that impact summertime surface ozone pollution patterns and activities, including observing smoke trajectories from prescribed and wildland fires.	[f]
Cooperative Forestry	Originally created in the 1930s, the current program started in 1978 to address watershed health and water quality activities on nonfederal forest lands. It provides restoration and management assistance activities, including cooperative federal, state, and local forest stewardship; prevention and control of insects and diseases; and improvement of fish and wildlife habitat.	[f]
Forest Health Management	This program was created in1947, with current program activities having begun in 1978 as a coordinated effort among federal, state, and local entities for the management of forest health on nonfederal forested lands. The program funds activities to sustain healthy forest conditions.	[f]
Recreation, Heritage, and Wilderness Management	The purpose of this program, which dates back to the 1930s, is to connect people to the land by providing recreational settings and services.	$36,685,000[g]
Soil, Water, and Air Management	This program funds activities related to the management of water, soil, and air resources for public use, including the inventory, assessment, and monitoring of these resources. It is classified as a cleanup, restoration, and pollution prevention program.	$8,939,000[g]

Program name	Purpose	Program expenditures (1992-2001)[a]
Watershed, Lake, Riparian and Stream Analysis, and Restoration	This research and restoration program, which started in 2000, studies watershed and stream processes from relatively undisturbed systems to highly degraded systems. It develops technologies to restore these systems and tests them in rural forested and urban landscapes.	$165,000[b]
Wildland Fire Management	Originally created in the 1920s, the purpose of the current program is to protect state and private lands from wildland fires by providing protection and management assistance.	[c]
Wildlife, Fish, and Rare Plants Resources Management	This program, which began in the 1930s, funds activities related to cleanup, restoration, pollution prevention, and habitat improvement. The program's goal is to maintain diverse and productive wildlife, fish, and sensitive plant habitats as an integral part of managing national forest ecosystems.	$24,486,000[b]
Department of Agriculture-Natural Resources Conservation Service (NRCS)		
Environmental Quality Incentives Program	The purpose of this program, created in 1985, is to provide technical, educational, and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. It funds pollution prevention, soil and water conservation, and water quality improvement activities.	[c]
Farmland Protection Program	This program, which began in 1996, provides matching funds to help purchase development rights to keep productive farm and ranch land in agricultural uses. The Department of Agriculture provides up to 50 percent of the fair market easement value.	[c]
National Cooperative Soil Survey (NCSS)	This program is a partnership of federal land management agencies, state agricultural experiment stations, and state and local units of government that provides soil survey information necessary for understanding, managing, conserving, and sustaining the nation's limited soil resources. It dates back to 1935.	[c]
Plant Materials for Conservation/Plant Materials	The purpose of this program, which began in 1937, is to use native plants to solve natural resource problems. Scientists search for plants that meet an identified conservation need, such as wetland restoration, and test their performance. Once proven, new species are released to the private sector for commercial production.	[c]
Resource Conservation and Development	This program, which started in 1962, encourages and improves the capability of state and local units of government and local nonprofit organizations in rural areas to plan, develop, and carry out programs for resource conservation and development. Program activities include cleanup, restoration, pollution prevention, coordination, and conservation technical services.	[c]
River Basin Studies, Watershed Surveys and Planning, and Watershed Protection and Flood Prevention	This mid-1940s program was created to provide planning assistance to federal, state, and local agencies for developing and coordinating water and related land resources programs in watershed and river basins. Program activities include restoration, pollution prevention, and financial and technical assistance for watershed protection and flood prevention.	[c]
Soil and Water Conservation/Conservation Technical Assistance	This program provides voluntary conservation technical assistance to land users, communities, units of state and local governments, and other federal agencies in planning and implementing conservation systems. It began in 1935, and it addresses natural resource issues, such as erosion, fish and wildlife habitat, and air quality. Its activities relate to cleanup, pollution prevention, restoration, and technical assistance.	[c]

Program name	Purpose	Program expenditures (1992-2001)[a]
Wetland Reserve Program	This voluntary program provides landowners with financial and technical assistance to restore and protect wetlands. It began in 1985, and it funds cleanup, restoration, and pollution prevention activities.	[f]
Wildlife Habitat Incentive Program	This is a voluntary restoration program for the development and improvement of wildlife habitat, primarily on private lands. It provides technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. The program began in 1998.	[f]
Department of Commerce-National Oceanic and Atmospheric Administration (NOAA)		
Coastal Mapping/Mapping and Charting Program	This program is part of the National Geodetic Survey. The primary mission of this program is to define the shoreline for nautical charts.	[f]
Coastal Remote Sensing, Coastal Change and Analysis Program	The goal of this program, which started in 2001, is to develop and distribute data in the coastal zone through remote sensing technology. The Great Lakes are the current focus of this program.	$458,000[f]
Coastal Zone Management Program	This program began in 1972. It is a federal-state partnership that provides a basis for protecting, restoring, and responsibly developing the nation's important and diverse coastal communities and resources. The program includes encouraging and assisting states in the wise use of land and water, and encouraging the participation and cooperation of all government sectors with programs affecting the coast.	$107,906,394[f]
Geodesy Program	This program, managed by the National Geodetic Survey, monitors crustal motion in the Great Lakes by measuring latitudes, longitudes, and elevations at 16 water level stations. This information provides better knowledge about flooding and drainage scenarios in the region.	[f]
Landscape Characterization and Restoration Program	This restoration program, which began in 1997, helps coastal resource managers examine the effects of management on coastal habitat through habitat restoration planning activities and ecosystem studies.	[f]
National Estuarine Research Reserve System (NERRS)	NERRS is a network of protected areas established to promote informed management of the nation's coastal and estuarine habitats. This state-federal partnership accomplishes this through linked programs of scientific understanding, education, and stewardship. This research program began in 1972.	$2,174,000
National Sea Grant College Program	The purpose of this research program, which began in 1968, is to support education and research in the various fields relating to the development of marine resources. All Great Lakes states, except Pennsylvania, have a Sea Grant College.	$69,600,000
National Status and Trends Mussel Watch Project	This program is a contaminant-monitoring program for U.S. coastal waters. It collects samples from some 300 sites in the conterminous United States, Alaska, Hawaii, Puerto Rico, and the Great Lakes. Samples are analyzed for a broad suite of contaminants, including toxic elements, pesticides, industrial chemicals, and hydrocarbons. This pollution prevention program began nationwide in 1986, with monitoring in the Great Lakes beginning in 1992.	$240,000
National Weather Service (NWS)	This program, which dates back to the 1890s, provides water, hydrologic, and climate warnings for the United States and its adjacent waters. Ten NWS Great Lakes forecast offices provide users with continuous real-time data and forecasts. NWS also operates the Environmental Modeling Center, which produces numerical weather prediction models that are transmitted to these forecast offices, and the National Data Buoy Center, which manages an observational network.	[f]

Program name	Purpose	Program expenditures (1992-2001)[a]
Office of Response and Restoration - Coastal Protection and Restoration Division	This division has undertaken, in coordination with cleanup and trustee agencies, environmental assessment, pollution prevention, cleanup, mitigation, and restoration activities to protect and restore coastal habitats and resources at hazardous waste sites nationwide since 1985 (in the Great Lakes since 1993).	[f]
Office of Response and Restoration - Damage Assessment Center	The Damage Assessment Center, which started in 1990, conducts natural resources damage assessments to restore coastal resources injured by oil and hazardous material releases. The center conducts cleanup, restoration, and pollution prevention activities.	[f]
Office of Response and Restoration - Hazardous Materials (HAZMAT)	This program, which started in 1987, conducts activities to reduce risks to coastal habitats and resources from oil and chemical spills by providing advice and developing tools to aid in spill response. HAZMAT undertakes cleanup, restoration, and pollution prevention activities.	[f]
Department of Interior-Fish and Wildlife Service (FWS)		
Aquatic Nuisance Species Regional Coordination and Technical Assistance	This program provides regional aquatic nuisance species coordination and technical assistance to the Fisheries Program of FWS's Northeast Region. Activities support regional prevention and control of aquatic nuisance species introductions and range expansions.	$808,900
Aquatic Nuisance Species Surveillance and Control	This program was started in 1991 to prevent and control infestations in the coastal and inland waters of the United States by the zebra mussel and other nonindigenous aquatic nuisance species. Its activities include research, prevention of species introductions, control of introduced species, and mitigation of impacts to native fish and wildlife resources.	$3,659,400
Endangered Species Program	This conservation and restoration program was created in 1973 to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and to provide for the conservation of such endangered and threatened species.	$4,078,500
Fish and Wildlife Management Assistance - Great Lakes Operations	This program, dating back to 1972, aids in conservation of native fish and wildlife species and their habitats. It provides support for the management of interjurisdictional fisheries, aids in restoration of depleted fish populations to preclude listing as endangered species, and provides technical assistance to state and tribal fish and wildlife management agencies to fulfill federal trust responsibilities. The program funds research, restoration, and technical assistance activities.	$5,915,000
La Crosse Fish Health Center	This center, which began operating in 1962, provides fish health inspection services to six national and four tribal fish hatcheries to minimize the risk of introducing disease agents into the wild. This program assists state research facilities and private fish hatcheries in diagnosing and controlling infectious disease agents and provides technical assistance regarding fish health and propagation.	$3,057,545
National Fish Passage Program	This program restores native fish and other aquatic species to self-sustaining levels. Generally, this restoration is done by removing barriers to fish movement or providing ways for aquatic species to bypass them. The program works on a voluntary basis with federal, state, local, and tribal agencies, as well as private partners and stakeholders. This restoration program's activities began in 1999.	$268,500
Natural Resource Damage Assessment Program	This program's goal is to restore, replace, rehabilitate, or acquire the equivalent of natural resources injured or lost as a result of contamination by oil or hazardous substances. This cleanup and restoration program began in 1981.	$2,496,000[m][o]

Program name	Purpose	Program expenditures (1992-2001)[a]
New York Aquatic Resource Management	The focus of this program is natural resource assessment and management planning on military installations. Specifically, the goal of this program is to determine the presence or absence of threatened or endangered species of state or national concern and to prepare a comprehensive natural resource management plan for the Seneca Army Depot and Fort Drum, both of which lie within the Great Lakes Basin.	$197,032[g]
New York Natural Resource Management Program	The primary focus of this program is natural resource assessment and planning on military installations. Activities under this program include conducting a natural resource community survey for the Niagara Falls Air Reserve Station, conducting additional surveys as needed, and preparing and implementing management plans to protect the natural resources. Program activities began in 1998.	$174,204[g]
Partners for Fish and Wildlife (Private Lands Program)	This is a voluntary habitat restoration program that provides restoration expertise and financial assistance to private landowners, tribes, and other conservation partners who voluntarily restore fish and wildlife habitat on their properties. The program targets restoring habitat for migratory birds, interjurisdictional fish, and threatened or endangered species on private land. Program activities began in 1987.	$5,240,000[h]
Department of Interior-U.S. Geological Survey (USGS)		
Biological Information Management Delivery	This research program has two primary areas relevant to the Great Lakes Basin: the National Biological Information Infrastructure (NBII) and the Gap Analysis Program (GAP). NBII was created in 1993 and provides increased access to data and information on biological resources. The GAP provides broad geographic information on biological diversity that planners, managers, and policy makers need to make informed decisions. In addition, the program provides support for Great Lakes research, primarily at the USGS Great Lakes Science Center.	$1,653,800[h]
Biological Research and Monitoring	This research program, dating back to 1927, funds biological studies to develop new methods and techniques to identify, observe, and manage fish and wildlife. Studies are designed to identify, understand, and control invasive species and their habitats; inventory populations of animals, plants, and their habitats; and monitor changes in abundance, distribution, and health of biological resources through time and determine the causes of the changes.	$10,078,775[g]
Coastal and Marine Geology	The program provides scientific information needed to evaluate the origin and impact of natural coastal processes, especially understanding the effect of human-induced changes. This program has been providing information and products to guide the preservation and sustainable development of the nation's marine and coastal environments since 1994.	[i]
Cooperative Research Units Program	This program, created in 1935, establishes and maintains cooperative partnerships with states and universities to address local, state, regional, national and international issues related to fish, wildlife, and natural resources of concern. The activities of the program are research, technical assistance, and student education.	$6,250,000[j]
Cooperative Topographic Mapping (CTM) Program	This research program provides data that locates and describes the features of the earth's surface. The program provides support for the National Map by continuing to maintain basic data for the United States and its territories.	[i]

Program name	Purpose	Program expenditures (1992-2001)[a]
Cooperative Water Program	This is an ongoing partnership between USGS and nonfederal agencies. The program jointly funds water resources projects in every state, Puerto Rico, and several U.S. Trust territories. Research, data collection, assessment, and aerial appraisal activities are conducted through this program.	[f]
Geographic Analysis and Monitoring Program	This program studies and addresses natural and human-induced changes on the landscape. It encompasses global change research, integrates natural hazard data layers, delivers landscape information, and provides computer support.	[f]
Land Remote Sensing Program	This program, initiated in the 1930s, promotes the use of remote sensing for understanding the earth's land environment through photography and other imagery from aircraft, as well as satellites.	[f]
Mineral Resources Program	This program, created in 1879, provides scientific information for resource assessments and research results of mineral potential, production, consumption, and environmental behavior. This information is used to characterize the life cycles of mineral commodities from deposit formation, exploration, and discovery through production, use, reuse, and disposal.	[f]
National Cooperative Geologic Mapping Program	This program was established in 1992 to implement and coordinate an expanded geologic mapping effort by USGS, the state geological surveys, and universities. The primary goal of the program is to collect, process, analyze, translate, and disseminate earth-science information through geologic maps.	[f]
National Water Quality Assessment (NAWQA) Program	The long-term mission and goals of the NAWQA program, which began in 1991, are to provide long-term, nationwide information on the quality of streams, groundwater, and aquatic ecosystems. NAWQA's goals are to assess the status and trends of national water quality and to understand the factors that affect it.	$16,039,000[c]
National Water Use Information Program	This program was created in 1979 to collect, store, analyze, and disseminate water-use information, both nationally and locally, to a wide variety of government agencies and private organizations. It is a cooperative program that includes state and local government entities.	[f]
USGS Ground-Water Resources Program	This program encompasses regional studies of groundwater systems; provides multidisciplinary studies of critical groundwater issues; provides access to groundwater data, and research and methods development. It also provides scientific information and many of the tools that are used by federal, state, and local management and regulatory agencies to make important decisions about the nation's groundwater resources. It was created in 1995.	$60,000[c]
USGS Toxic Substances Hydrology Program	This program was created in 1982 to provide scientific information and tools that explain the occurrence, behavior, and effects of toxic substances in the nation's hydrologic environments. Program results support decision making by resource managers, regulators, industry, and the public. Work is performed by USGS scientists who collaborate with a wide range of federal and nonfederal organizations and individuals.	[f]
Water Resource Research Act Programs	This program, dating back to 1964, provides an institutional mechanism for promoting state, regional, and national coordination of water resources, research, and training. It comprises a network of institutes to facilitate research and information technology transfer. With its matching requirements, it is also a mechanism for promoting state investments in research and training.	[f]

Program name	Purpose	Program expenditures (1992-2001)[a]
Earth Surface Dynamics Program - Central Great Lakes Geologic Mapping Coalition	This 1998 initiated research program provides scientific information to evaluate natural coastal processes and understand human-induced changes. It develops predictive models of natural systems and the effects of human activities on them, and the capability to predict future changes. Program data is used to guide the preservation and sustainable development of the nation's marine and coastal environments.	$2,977,000[c]
Department of Homeland Security-Coast Guard		
National Invasive Species Act/Ballast Water Program	Under this program, the Secretary of Transportation issues national guidelines to prevent the introduction of aquatic nuisance species into U.S. waters by ships.	$8,000,000[c]
Oil Spill Removal Organization Program	This is a voluntary pollution prevention program created by the Coast Guard to assist facility and vessel responders in writing their oil spill response plans.	[f]
Environmental Protection Agency (EPA)		
Air Program	The purpose of this program, which began in 1970, is to (1) protect and enhance the quality of the nation's air resources, (2) initiate and accelerate a national research and development program to achieve the prevention and control of air pollution, (3) provide technical and financial assistance to state and local governments in connection with the development and execution of their air pollution prevention and control programs, and (4) encourage and assist the development and operation of regional air pollution prevention and control programs.	[f]
Aquatic Stressors Research Program	The goal of this research program, which began in 1975, is to advance scientifically sound approaches for monitoring trends in ecological conditions of the nation's aquatic resources, including the Great Lakes; identify impaired watersheds and diagnose causes of degradation; and develop risk-based assessments for supporting restoration and remediation decisions.	[f]
Children's Health Program	This program (1) identifies and evaluates children's health issues, (2) develops approaches for addressing these issues, and (3) prioritizes and implements appropriate actions on children's health issues. This 1997 program funds pollution prevention activities and is largely a voluntary program building state capacity in human health.	[f]
Clean Water Act (CWA) Water Quality Monitoring	Operating since 1972, this program develops and implements comprehensive monitoring programs at the state and tribal levels to address all water quality management needs under the CWA. This program focuses on research.	[f]
Clean Water Section 106 Grants	This 1972 program awards grants to states and to eligible Indian tribes as base program support to maintain their surface water and groundwater programs. Program activities include planning, water quality standards development and implementation, monitoring, permitting, education and outreach, and program administration.	[f]
Clean Water State Revolving Fund	The purpose of this program is to provide grants to states for long-term financing for construction of wastewater treatment facilities and implementation of state management plans. This program began in 1972.	[f]
Drinking Water State Revolving Fund	This program provides grants to states to establish drinking water state revolving funds, whose purpose is to support drinking water system infrastructure improvements. These grants provide loans and other types of financial assistance to eligible public water supply authorities. The program started in 1996.	[f]

Program name	Purpose	Program expenditures (1992-2001)[a]
Environmental Justice Small Grants	This program, which began in 1994, provides financial assistance to grassroots community-based groups to support projects to design, demonstrate, or disseminate practices, methods, or techniques related to environmental justice.	$256,047[m]
Environmental Justice Through Pollution Prevention Grants	This pollution prevention program provides low income, minority communities with pollution prevention resources to address community environmental issues. This program started as a pilot program in 1995 through discretionary funds, but the last year of funding was 2001.	[l]
Environmental Monitoring and Assessment Program	The goal of this program is to advance scientifically sound approaches for monitoring trends in ecological conditions of the nation's aquatic resources, including the Great Lakes. The program identifies impaired watersheds and diagnoses causes of degradation and forecasts risk-based assessments and options to support restoration and remediation decisions. This research program began in 1989.	[l]
Food Quality Protection Act/Strategic Agricultural Initiative	The purpose of this program is to ensure continuing safety of the nation's food supply by promoting the transition from potentially hazardous conventional pesticides to pesticides with reduced risk to human health and the environment. This program started in 1998.	[l]
Global Climate Change Research Program	The goal of this program is to advance scientifically sound approaches for monitoring trends in ecological conditions of the nation's aquatic resources, including the Great Lakes. Program activities identify impaired watersheds and diagnose causes of degradation. This research program began in 1975.	[l]
Indian Environmental General Assistance Program	This 1992 program assists federally recognized Indian tribes and nations to build their overall capacity to manage environmental programs and conduct activities.	[l]
National Pollution Discharge Elimination System	The goal of this program is to assure that U.S. waters remain fishable, swimmable, and drinkable, through regulating point source discharges to surface water. The program ensures that discharges do not cause or contribute to a violation of water quality standards. This program started in 1972 and is largely delegated to states.	[l]
Non-Point Source Program	The purpose of this program is to attain the goals of the CWA. This restoration and pollution prevention program started in 1987.	[l]
Polychlorinated Biphenyls (PCB) Program	This program was created in 1980 to conduct several activities related to PCBs. These activities include reviewing and tracking projects involving the remediation, storage, and disposal of PCBs; conducting inspections to determine compliance with federal PCB regulations; and conducting projects for reducing the use of PCBs. This program includes cleanup and pollution prevention.	[l]
Pollution Prevention (P2) Demonstration Grants	This program provides grants for capacity building and for innovative pollution prevention projects, especially those projects having potential for regional impacts. Funded projects include supporting the Great Lakes regional P2 roundtable, providing technical assistance, and coordinating P2 partnerships. This pollution prevention program began in 1993.	[l]
Pollution Prevention for States Grant Program	The goal of this grant program is to promote strategies and solutions that assist businesses and industries in reducing waste at the source. The majority of grants fund state-based projects in areas of technical assistance and training, education and outreach, regulatory integration, data collection and research, demonstration projects, and recognition programs. This pollution prevention program began in 1991.	[l]

Program name	Purpose	Program expenditures (1992-2001)[a]
Public Water Supply Program	The purpose of this program is to ensure that clean and safe drinking water is provided to the public. This program was created in 1974.	[f]
Resource Conservation and Recovery Act (RCRA) Brownfields	The goal of the program is to encourage re-use of properties that have been stigmatized by the presence of, or perception of, environmental contamination. This restoration program began in 1998.	[f]
RCRA Subtitle C Enforcement and Compliance Program	This program provides for the on-site evaluation and inspection of hazardous waste sites to enforce compliance with regulations designed for protecting human health and the environment and conserving valuable material and energy resources. This program, started in 1976, involves cleanup, restoration, and pollution prevention.	[f]
RCRA Subtitle C Hazardous Waste Management Program Support	This program assists state governments in the development and implementation of an authorized state hazardous waste management program for the purpose of controlling the generation, transportation, storage, and disposal of hazardous waste. Funding first began in 1978.	[f]
RCRA Subtitle C Corrective Action Program	The goals of this program are evaluating the potential environmental risk impacts from RCRA-regulated hazardous waste facilities, ensuring adequate facility investigation, ensuring cleanup of contaminants, and managing facilities' long-term controls for the protection of human health and the environment. This cleanup and restoration program started in 1980.	[f]
RCRA Subtitle C Permitting	The purpose of this program is to issue permits that allow for monitoring the handling of hazardous waste to ensure better waste management and restoration of contaminated waste sites through a regulated permitting program. This program started in 1980, and it addresses restoration and pollution prevention in accordance with RCRA regulations.	[f]
RCRA Subtitle D Solid Waste Management Assistance Program/Jobs Through Recycling Initiative	The purpose of this program is to promote use of integrated solid waste management systems to solve municipal solid waste generation and management problems at the local, regional, and national levels. The program provides assistance to state, local, and tribal governments and organizations to increase waste diversion from landfills and incinerators. This pollution prevention program started in 1976.	[f]
RCRA Subtitle D Tribal Solid Waste Assistance Grants	This 1993 program was created to assist tribes to achieve solid waste management and promote compliance with the provisions of RCRA Subtitle D. This is a cleanup, restoration, and pollution prevention program.	[f]
RCRA Subtitle I Underground Storage Tanks and Leaking Underground Storage Tanks	This program regulates the use of underground storage tanks and requires cleanup of releases and spills. This cleanup program started in 1989.	[f]
Regional Geographic Initiative (RGI)/Environmental Priorities Program (EPP)	The purpose of RGI is to (1) fund projects that are identified as high priority, (2) support geographic place-based projects, (3) address multimedia problems, and (4) highlight agency priorities and strategies. The purpose of EPP is to fund projects or purchases that aid in environmental protection. These activities were started in 1994, and they include research, cleanup, restoration, and pollution prevention.	$6,753,937[f]
Solid Waste Management Assistance Program/Jobs Through Recycling Initiative	The purpose of this program is to promote use of integrated solid waste management systems to solve municipal solid waste generation and management problems at the local, regional, and national levels. The program provides assistance to state, local, and tribal governments and organizations to increase waste diversion from landfills and incinerators. This pollution prevention program started in 1976.	[f]

Program name	Purpose	Program expenditures (1992-2001)[a]
State and Tribal Environmental Justice (EJ) Program	This program was created to provide capacity building financial assistance to states and tribes that are working to address EJ issues. This program started in 1998.	[f]
Superfund	The goal of this program is to protect human health and the environment from risks associated with abandoned hazardous waste sites and to respond to hazardous substance spill emergencies. The primary focus of the program is the assessment and remediation of long-term cleanups. This cleanup program was created in 1980.	$749,149,250[e]
Total Maximum Daily Load Program	The purpose of this 1973 program is to identify waters not meeting state water quality standards, and for those waters, calculate the maximum amount of a pollutant the water can receive and still meet water quality standards. This is a restoration program according to EPA officials.	[f]
Tribal Solid Waste Assistance Grants	This 1993 program was created to assist tribes in solid waste management and promote compliance with the provisions of RCRA Subtitle D. This is a cleanup, restoration, and pollution prevention program.	[f]
Underground Injection Control	The program was created to protect underground sources of drinking water by controlling underground injection. This is a pollution prevention program.	[f]
Underground Storage Tanks and Leaking Underground Storage Tanks	This program regulates the use of underground storage tanks and requires the cleanup of releases and spills. This cleanup program started in 1989.	[f]
Waste Pesticide Collection Program (Agricultural Clean Sweep or Waste Pesticide Disposal)	This pollution prevention program achieves reductions in persistent bioaccumulative toxins and prevents contamination of air, soil, and water resources by safely disposing of pesticides. This program started in 1988.	$194,000[g]
Water Quality Management Planning	The purpose of this program, which began in 1972, is to promote the enhancement of water quality through water quality management planning. This program involves both restoration and pollution prevention.	[f]
Water Quality Standards Program	The purpose of this program is to support efforts to restore and maintain the chemical, physical, and biological integrity of the nation's waters by defining the uses to be protected and the water quality conditions needed to protect these uses.	[f]
Wetlands	The goal of this 1972 program is to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Wetland Program Development Grants are designed to assist state, tribal, and local government agencies in building their wetland management programs.	$129,000[h]

Sources: The Corps, ARS, CSREES, FSA, FS, NRCS, NOAA, FWS, USGS, Coast Guard, EPA, and GAO.

[a]Unless otherwise noted, the funding figures in this column represent program federal fiscal year expenditures.

[b]Funding represents fiscal years 1998 through 2001.

[c]Funding represents fiscal years 1997 through 2001.

[d]Funding represents fiscal years 1994 through 2001.

[e]Funding is for all Great Lakes states, except for Pennsylvania. Figures were only available for fiscal years 1999 and 2000.

[f]Great Lakes Basin funding is not known for this nationwide program.

[g]Funding amounts are for the Huron-Manistee, Ottawa, and Hiawatha Forests, all of which are entirely within the Great Lakes Basin. There is additional funding within the basin, but the precise amount could not be determined.

[h]Funding represents fiscal years 2000 and 2001.

[1]Funding represents fiscal year 2001.

[2]Funding represents fiscal years 1993 through 2001.

[3]This program did not receive any specific funding for the Great Lakes Basin for this time period.

[4]Funding is for fiscal years 1995 to 2001. Support totaling $47.9 million has come in from additional sources over the same time frame. All Sea Grant programs and projects are matched to at least the 50 percent level by nonfederal funds from academia, state agencies, industry, or other sources.

[5]Funding represents fiscal years 1995 through 2001.

[6]Funding represents fiscal years 1999 through 2001.

[7]Funding represents base funding. Department of Interior provides approximately $850,000 more in competitive funding annually.

[8]This funding is for fiscal years 1998 through 2001 and it was provided by several different sources, including the program's specific funding authority.

[9]Funding for this program came from the Department of Defense.

[10]Funding amounts are appropriated funds.

[11]Funding is approximate. The agency did not respond to our survey, so the figures were obtained from the report entitled *The Great Lakes at the Millennium: Priorities for Fiscal 2001*, prepared by the Northeast-Midwest Institute.

[12]Funding amount is for Region 2 and Region 5.

[13]Funding amount is for Region 3 and Region 5.

[14]Funding amount is for Region 2 only.

Table 6 contains a listing of the non-Great Lakes specific programs managed by state agencies.

Table 6: State Non-Great Lakes Specific Programs

Program name	Purpose	Program expenditures (1992-2001)[a]
Indiana Department of Natural Resources (IDNR)		
Lake and River Enhancement Program	This program started in 1987, and it funds restoration activities by providing technical and financial assistance for projects that reduce nonpoint source sediment and nutrient pollution in Indiana's and adjacent state's surface waters.	
Michigan Department of Environmental Quality (MDEQ)		
Michigan State University Forestry Department Dendroremediation	This is a research program administered by Michigan State University. The project began in fiscal year 2000 and funds activities to determine the existence of woody plants, especially native species that would be useful for various approaches to the remediation of heavy metals in soil and/or groundwater. The program also looked to determine whether plants adapted to growing on a site with elevated heavy metals in soils results in greater tolerance for, and ability to takeup, heavy metals.	$594,888
Minnesota Board of Water and Soil Resources (MBWSR)		
Comprehensive Local Water Planning Challenge Grant Program	The challenge grant program began in 1989, and it funds priority projects identified by local governments in their local water plans. It funds restoration activities by providing financial and technical assistance to counties for development and implementation of local water plans.	$428,732[b]
Erosion, Sediment Control, and Water Quality Cost-Share Program	This program was initiated in 1977, and it provides funds to soil and water conservation districts for cost-sharing conservation projects that protect and improve water quality by controlling soil erosion and reducing sedimentation. This restoration program provides technical and financial assistance to landowners who install permanent nonproduction-oriented practices to protect and improve soil and water resources.	$1,293,298[b]
Lakeshore Engineering Program	This program was created in 1991 to support local governments' large erosion control projects on Lake Superior shores by providing engineering assistance, education, and best management practices. Its activities relate to restoration and research to control erosion from private and public shorelines.	$976,313[b]
Local Water Planning and Wetland Conservation Act	This block grant program began in 1985 to assist local governments in implementing four state-mandated programs. Water planning grants are available for restoration activities related to implementing comprehensive water plans and the local administration of grants.	$3,205,505[b]
Minnesota Department of Commerce (MDOC)		
Petroleum Tank Release Cleanup Fund (Petrofund)	The petrofund program was created in 1987 to fund the replacement or upgrade of all underground petroleum storage tanks by 1998. The program provides financial assistance to owners and operators of petroleum storage tanks to assist in cleaning up contamination or replacing leaking tanks. Available program funding is capped at $1 million per project.	$18,514,720[b]

Program name	Purpose	Program expenditures (1992-2001)[a]
Minnesota Department of Natural Resources (MDNR)		
Conservation Partnership Program	This program was started in 1995 to provide grants to private organizations and local units of government for activities related to restorations of fish, wildlife, and native plant habitats. The program also funds research to improve fish and wildlife habitats.	[b]
Environmental Partnership Grant Program	This grant program was initiated in 1997 to provide funding for private companies and local governments for research, cleanup, pollution prevention, and education projects that deal with environmental conservation principles.	[b]
Minnesota Pollution Control Agency (MPCA)		
Basin Planning	MPCA created this program in 1995 to coordinate water management efforts around the state's 10 major drainage basins by focusing financial and staff resources upon key water resource management priorities. The program provides support to local and state agencies and citizen groups to develop watershed plans for making sound resource management decisions. Program activities included research, cleanup, restoration, and pollution prevention.	$175,000[c]
Clean Water Partnership	The program was created in 1987 to fund activities related to runoff from agricultural and urban areas. The program provides funds to local governments for projects that protect and improve lakes, streams, and groundwater resources in Minnesota. Funds can be requested for research, cleanup, restoration, or pollution prevention projects.	$2,613,798[b]
Minnesota Environmental Response and Liability Act	This is Minnesota's Superfund program. It was created in 1983 to fund activities related to investigating and cleaning up releases of hazardous substances or contaminants. As of 1989, the program's authority included funding to investigate and clean up contamination from agricultural chemicals.	$864,410[b]
Minnesota Landfill Cleanup Program (Closed Landfill Program)	This cleanup program was created in 1994 as an alternative to using the federal and state Superfund laws to address the cleanup and long-term maintenance of 106 closed municipal sanitary landfills in the state. Eight of these landfills are in the Lake Superior watershed. Funds are provided for cleanup activities only.	$485,135[d]
Minnesota Mercury Initiative	The purpose of this program is to help reduce mercury contamination in Minnesota fish. Because about 98 percent of mercury in Minnesota waters is due to air deposition, the state looked for ways to reduce mercury in the air. The program solicits voluntary mercury emission reductions from large companies.	[b]
Voluntary Petroleum Investigation and Cleanup	This program was created in 1996 to provide technical assistance and liability assurance to expedite and facilitate the development, transfer, and investigation and/or cleanup of property that is contaminated from petroleum products. MPCA provides technical oversight for this cleanup program.	[b]
New York Department of Environmental Conservation (NYDEC)		
Clean Water and Clean Air Bond Act	This program was established in 1996. It consolidates the funding application processes of several state agencies and programs with a focus on cleanup, restoration, water resource improvement, pollution prevention, nonpoint source abatement, aquatic habitat restoration, safe drinking water system improvement, solid waste management, and other environmental conservation efforts.	$428,820,724[d]

Program name	Purpose	Program expenditures (1992-2001)[a]
Environmental Protection Act and Fund	The purpose of this program is to address the cleanup, restoration, historic preservation, land and open space conservation, and waterfront revitalization of New York watersheds. Proposed projects are reviewed under the consolidated bond application process.	$97,154,829[c]
Fish and Wildlife Conservation Act and Environmental Conservation Fund	This program was created in 1972 to provide the necessary resources to support the state's critical fish and wildlife conservation programs by focusing on the care, management, protection, and enlargement of fish and wildlife resources through research and restoration. Activities also include habitat improvement and enforcement.	$2,500,000[c]
New York State Environmental Quality Protection Fund (Superfund)	This program was started in 1980 in response to the federal Superfund. The state's Superfund program is focused on the investigation, emergency response, and enforcement of cleanups at hazardous waste sites.	[b]
Ohio Department of Natural Resources (ODNR)		
Dam Safety	Created in 1963, the purpose of this regulatory program is to protect the citizens of Ohio from flooding due to dam failure. The program provides support to the owners of dams and residents in downstream areas by permitting the construction of new dams and dikes, approving repairs to existing dams and dikes, and responding to safety emergencies.	[b]
Ground Water Resources	This program was started in 1959, and it seeks to collect, maintain, interpret, and distribute information on the groundwater resources of Ohio in both the Lake Erie and Ohio River basins. Its basic purpose is to foster the development of groundwater as a viable and sustainable water supply for the citizens of the state.	[b]
Hydraulic/Canal Operations	This program was created during the 1800s to operate and maintain the watered portions of the historic Miami/Erie and Ohio/Erie Canals, including water supply distribution, storm water control, historic preservation and recreation. Residents and properties adjacent and downstream from the canal and reservoirs are protected from flooding through the operation of hydraulic structures.	[b]
Pollution Abatement Cost Share	Since 1979, this program has provided funding to landowners to assist in the installation of needed best management practices that abate animal waste pollution, soil erosion, or degradation of the state's waters by soil sediment.	[b]
Water Inventory and Stream and Water Gauging	The purpose of this program, created in 1959, is to collect, compile, analyze, and disseminate hydrologic and climatological data and information concerning all aspects of the hydrologic cycle, operate the statewide groundwater observation well network, and administer cooperative agreements with USGS for stream gauging and other water resource projects.	[b]
Water Planning	This program was created in 1959 to address the need for water supply planning on a regional and statewide basis. It also includes administering the Lake Erie and Ohio River basins' diversion permit and consumptive use permit programs, water resource inventory, and the Lake Erie Basin Plan.	[b]
Ohio Environmental Protection Agency (OEPA)		
Clean Ohio Fund	This program, which began in 2001, awards grants for cleanup and restoration of polluted areas and the preservation and conservation of green space and farmland. The first grant was not awarded until 2002.	[b]

Program name	Purpose	Program expenditures (1992-2001)[a]
Pennsylvania Department of Environmental Protection (PDEP)		
Growing Greener Grant Program	This program began in 1999 to address critical concerns related to education and outreach, as well as wetland restoration, soil erosion and sedimentation controls, and creek assessments in Lake Erie tributaries.	$700,000[c]
Pennsylvania Coastal Zone Program	This program was created in 1980 to support studies of evasive species, bluff evaluations, and property preservation activities identified by the Office of the Great Lakes.	$938,000[d]
Wisconsin Department of Commerce (WDOC)		
Brownfields Grant Program	This grant program began in 1998 to provide financial assistance for Brownfields redevelopment and related environmental remediation projects. It also funds associated environmental remediation activities with emphasis on cleanup and restoration.	[b]
Wisconsin Department of Natural Resources (WDNR)		
Dry Cleaner Fund	This environmental response program was created in 1997 to provide financial assistance awards for reimbursement of certain eligible costs to investigate and remediate contamination from dry cleaning solvents at current and certain former dry cleaning facilities. Program efforts are focused on cleanup and restoration.	[b]
Runoff Management Program	This program began in 1998 and is aimed at abating urban and rural polluted runoff. Three components of the program include (1) implementation of the voluntary Priority Watershed/Lake Projects, (2) point source permitting of storm water and agricultural runoff sources, and (3) implementation of state regulatory performance standards. Its primary focus is research and cleanup.	[b]
Site Assessment Grants	This grant program was started in 2000 to provide local governments with grants to perform the initial investigation of contaminated properties and certain other eligible activities. Its focus is the restoration and cleanup of abandoned, idle, or underused industrial or commercial facilities and sites.	[b]
State Funded Response Program (Environmental Repair)	This is the state's version of the Superfund program, authorized in 1978, but not started until 1985. The program focuses on the cleanup and restoration of all types of hazardous substance sites, including unlicensed or abandoned sites, and can also be used to respond to hazardous substance spills.	[b]
Sustainable Urban Development Zone Program	This 1999 WDNR pilot program operates in cooperation with other state agencies and the cities of Milwaukee, Green Bay, La Crosse, Oshkosh, and Beloit. It seeks to promote the use of financial incentives to clean up, restore, and redevelop contaminated properties in the five cities. Funds may be used to investigate environmental contamination and clean up Brownfields properties in the cities.	$1,700,000[e]

Sources: IDNR, MDEQ, MBWSR, MDOC, MDNR, MPCA, NYDEC, ODNR, OEPA, PDEP, WDOC, WDNR, and GAO.

[a]Unless otherwise noted, the funding figures in this column represent program state fiscal year expenditures.

[b]Program officials could not provide specific Great Lakes funding for this statewide program.

[c]This funding was only for those counties that reside within the Great Lakes Basin.

[d]This amount was provided from 1993 through 2001. It includes total grant funds and 80 percent of the administrative salary costs for the engineer.

[e]This program requires a dollar-for-dollar match by local government.

[7]These funds were spent in the Lake Superior watershed to clean up 628 sites. A 2 percent fee on bulk petroleum sales generates the funding.

[8]This figure relates to Lake Superior funding only for this statewide program.

[9]This figure is a 10 year average and relates to Lake Superior funding only.

[10]This funding was provided from 1995 through 2001, and only for the eight Great Lakes specific sites.

[11]These funds were either expended or committed for Great Lakes Basin projects during the period 1998 through 2001 (state fiscal year).

[12]Program officials could not identify the Great Lakes funding for this statewide program; however, responsible parties have provided more than $400 million for cleanup actions.

[13]Program funding covers state fiscal years1999 through 2001.

[14]This funding figure is for state fiscal year 2001 only.

[15]This amount was identified as the expenditure during state fiscal years 2000 and 2001 by three of the cities. It is not total Great Lakes spending.

Appendix III: Corps of Engineers Special Authorized Projects in the Great Lakes Basin, Fiscal Years 1992 through 2001

State	Project title	Program description	Amount
Illinois			
	Des Plaines River, Ill.	Flood damage reduction - The purpose of this project was to develop measures to reduce or prevent damage from flooding to areas, such as reservoirs, and levees; make channel modifications; remove threatened structures from flood-prone areas, and enhance flood plain management.	$2,496,507
	Kankakee River Basin	Flood damage reduction	1,591,856
	Illinois Shore Erosion	Stream bank and shoreline protection – This project was designed to protect public structures or facilities from damages caused by stream bank erosion or flooding caused by waves from coastal storms, to include hardened protective structures.	254,177
	Chicago River North Branch 1946	Navigation improvements – These projects may involve new channels and structures, such as breakwaters and piers or modifications to existing navigation facilities, such as deepening or lengthening navigation channel.	64,100
	Southeast Chicago, Ill.	Flood damage reduction	595,800
	Waukegan Harbor, Ill.	Flood damage reduction	338,128
	Casino Beach, Ill.	Erosion control – The purpose of this project is providing erosion control.	2,111,815
	Illinois Beach State Park	Ecosystem restoration – These projects seek to restore, protect, or enhance aquatic habitat, such as wetlands and spawning areas, and include efforts to restore degraded lakes and rivers, remove contamination, and provide natural vegetation.	160,640
	McCook & Thornton Reservoir	Flood damage reduction	32,770,600
	Kankakee River Icebreaker	Flood damage reduction	9,200
	North Branch Chicago River	Flood damage reduction	6,754,844
	O'Hare Reservoir	Flood damage reduction	28,088,930
	Chicago Shoreline	Streambank and shoreline protection	93,824,976
	Illinois & Michigan Canal	Navigation improvements	307,100
	Chicago Sanitary & Ship Canal	Ecosystem restoration	1,778,721
	Des Plaines Wetlands Project	Flood damage reduction	183,308
			$171,330,702
Indiana			
	Beauty Creek Watershed, Ind.	Flood damage reduction	$95,900
	Deep River Basin, Ind.	Flood damage reduction	68,600
	Long Lake, Ind.	Ecosystem restoration	75,000
	Hammond, Ind.	Streambank and shoreline protection	42,000
	Little Calumet River Basin, Dyer, Ind.	Flood damage reduction	310,700
	Little Calumet River Basin Township	Flood damage reduction	82,900
	Lake George	Flood damage reduction	1,117,300
	Little Calumet River, Cady Marsh Ditch	Flood damage reduction	1,355,588
	Indiana Shore Erosion	Erosion control	8,239,944
	Little Calumet River	Flood damage reduction	78,770,000
	Indiana Harbor CDF	Navigation improvements	1,297,300

State	Project title	Program description	Amount
	Burns Waterway Harbor, Ind.	Navigation improvements	13,384,194
	Calumet Region, Ind.[a]	Environmental infrastructure	58,903
	Wolf Lake, Ind.	Ecosystem restoration	98,700
	Fort Wayne Metro Area, Ind.	Flood damage reduction	33,944,000
			$138,941,029
Michigan			
	Clinton River Spillway, Mich.	Flood damage reduction	$2,403,300
	Cedar River Harbor, Mich.	Navigation improvements	193,000
	Great Lakes Connecting Channels & Harbors, Mich.	Navigation improvements	300,800
	Great Lakes Connecting Channels & Harbors Replacement Lock, Mich.	Navigation improvements	2,740,000
			$5,637,100
Minnesota			
	Silver Bay Harbor, Minn.	Navigation improvements	$2,600,100
	Knife River Harbor, Minn.	Navigation improvements	116,000
	Duluth-Superior Harbor, Minn. & Wisc.	Navigation improvements	645,400
			$3,361,500
New York			
	New York State Barge Canal	Navigation improvements	$25,479
	Onondaga Lake, N.Y.[a]	Environmental infrastructure	4,169,999
	Onondaga Lake, N.Y. PL 101-596	Environmental infrastructure	2,864,213
	Olcott Harbor, N.Y.	Navigation improvements	1,056,243
	Buffalo Flood and Water Quality	Environmental infrastructure	435,987
	Ellicott Creek, N.Y.	Flood damage reduction	131,307
	Oneida Lake, N.Y.	The purpose of this project is ecosystem restoration and flood damage reduction.	68,881
	Hamlin and Lakeside Beach State Park	Stream bank and shoreline protection	47,887
			$8,799,996
Ohio			
	Cleveland Harbor Recon Study	Navigation improvements	$292,994
	Cleveland Harbor Phase I	Navigation improvements	4,001,960
	Reno Beach, Howard Farms	Flood damage reduction	4,357,730
	Ottawa River, Ohio	Navigation improvements	183,000
	Ohio Infrastructure[a]	Environmental infrastructure	160,840
	Maumee River, Ohio	Flood damage reduction	102,037
	Western Lake Erie Basin	The purpose of this project is flood damage reduction and ecosystem restoration.	67,164
	Cayuga Creek Watershed	Flood damage reduction	25,868
	Sandusky River, Tiffin, Ohio	Flood damage reduction	71,722
			$9,263,315

State	Project title	Program description	Amount
Pennsylvania			
	Presque Isle, Penn. Permanent	Stream bank and shoreline protection	$15,295,637
	Erie Harbor, East Canal Basin, Penn.	Environmental infrastructure	5,480,000
			$20,775,637
Wisconsin			
Wisconsin had one project that was jointly shared with Minnesota.			0
Total			**$358,109,279**

Sources: Corps of Engineers and GAO.

* According to the Corps, this special project was authorized as an open-ended project without a stated expiration time frame. Project funding could be appropriated several years into the future.

Appendix IV: Federal and State Great Lakes Specific Programs, Fiscal Years 1992 through 2001

Table 7 contains a listing of the federal programs that specifically fund activities in the Great Lakes Basin.

Table 7: Federal Great Lakes Specific Programs

Program name	Purpose	Program expenditures (1992-2001)[a]
Army Corps of Engineers		
Great Lakes Fishery and Ecosystem Restoration	The purpose of this fiscal year 2000 program, which began in 2002, is to plan, design, and construct projects to restore Great Lakes fisheries and their beneficial uses.	[b]
Great Lakes Remedial Action Plans and Sediment Remediation	This program was started in 1990 to plan, design, and construct research demonstration projects of promising technologies for contaminated sediment remediation.	[c]
Great Lakes Remedial Action Plans and Sediment Remediation Support	This program, which was authorized in 1990, is designed to provide technical support focused on the development and implementation of remedial action plans to clean up the Great Lakes' areas of concern.	$2,595,600[d]
Great Lakes Tributary Models	This program was created in 1996. Its purpose is to develop computer models of sediment loading and transport to Great Lakes tributaries to support state and local conservation and pollution prevention activities.	$1,103,424
Department of Agriculture-Natural Resources Conservation Service		
Great Lakes Basin Program for Soil Erosion and Sediment Control	Originally authorized in 1936, the program, as amended, funds pollution prevention projects that improve Great Lakes water quality by promoting soil erosion and sediment control through information and education programs, grants, technical assistance, and coalition building.	$3,625,000[e]
Department of Commerce-National Oceanic and Atmospheric Administration		
Episodic Events, Great Lakes Experiment	This research program began in 1997 to create a modeling program for seasonal sediment resuspension. It assesses the (1) impact on transporting and the transformation of chemically important materials and (2) effect on Lake Michigan ecology.	$3,792,000[f]
Great Lakes Environmental Research Laboratory	This program was established in 1970 and established the Great Lakes Environmental Research Laboratory to conduct physical, chemical, and environmental modeling research and to provide scientific expertise and services to manage and protect ecosystems.	$63,401,000[g]
Department of Health and Human Services-Agency for Toxic Substances and Disease Registry		
Great Lakes Human Health Effects Research Program	This is a community-based research program that began in 1992, with emphasis on public health education and intervention strategies. Its goal is to prohibit exposure to toxic chemicals and prevent adverse health outcomes in citizens of the Great Lakes.	$24,400,000[h]
Department of Interior-Fish and Wildlife Service		
1836 Fisheries Treaty - Implementation of the August 7, 2000 Consent Decree	This program was mandated in 2000 by a Federal District Court decree. It requires FWS to increase lake trout stocking for restoration programs and to evaluate factors impeding lake trout restoration. It also provides technical assistance to five Native American tribes in the Chippewa-Ottawa Resource Authority, the State of Michigan, and selected federal agencies involved with managing sport and commercial fisheries in certain areas of Lakes	$695,000

Program name	Purpose	Program expenditures (1992-2001)[a]
	Superior, Huron, and Michigan.	
Blue Pike Activities in the Great Lakes	This is a research program that was started in 1993 to establish the scientific relationships among the original Lake Erie blue pike, the recently caught "blue walleyes," and other closely related species using genetic analysis of their DNA.	[i]
Ecosystem Management in the Lower Great Lakes	This program was created in 1990 to develop and adopt aquatic community and habitat goals and objectives. It also develops and conducts comprehensive and standardized ecological monitoring to support ecosystem management.	[i]
Evaluation and Restoration of Great Lakes Estuaries and Tributaries	The purpose of this program, which began in 1992, is to identify, inventory, protect, and rehabilitate significant aquatic habitats, including those used by fish and wildlife for spawning, breeding, nesting, rearing, and feeding.	[i]
Great Lakes Coastal Program	This program, which began in 2000, funds projects that seek to protect and restore Great Lakes coastal ecosystems for the benefit of fish, wildlife, and people. Its goals are to identify and prioritize coastal habitats and conduct research to evaluate ecosystem health, identify threats, and lend biological focus to the planning processes of other agencies.	$500,000[j]
Great Lakes Fish and Wildlife Restoration Act	Since 1991, this program has developed and implemented proposals for restoration of fish and wildlife resources in the Great Lakes Basin. It has provided assistance to the Great Lakes Fishery Commission, states, Indian tribes, and others to encourage cooperative conservation, restoration, and management of the fish and wildlife resources and their habitats.	$10,512,000[k]
Great Lakes Lake Sturgeon Rehabilitation Program	This program started in 1993, and it funds projects that seek to conserve, rehabilitate, and reestablish self-sustaining populations of lake sturgeon to levels that permit delisting from state and federal endangered species lists. Objectives include identification and restoration of critical habitat and public education.	$246,650[l]
Lake Ontario Atlantic Salmon Reintroduction Program	This research program was started in 1993 to determine the feasibility of re-introducing/restoring Atlantic salmon to the Lake Ontario watershed.	[i]
Lake Ontario/St. Lawrence River American Eel Restoration Program	This research program, which started in 1997, provides research funds to protect and enhance the abundance of American eel populations in the Lake Ontario/St. Lawrence River watershed.	[i]
Lower Great Lakes Lake Trout Restoration Program	The purpose of this program is to rehabilitate the lake trout population of Lakes Erie and Ontario so the new population can become self-sustaining through natural reproduction and produce a harvestable annual surplus. Program activities began in the late 1970s.	[i]
Lower Great Lakes Ruffe Surveillance Program	This 1993 program provides funding for surveillance of invasive species to ensure prompt detection of new populations of ruffe and monitor or track expansions of already existing populations.	$241,439[m]
National Fish Hatchery System - Great Lakes Operations	This program began operation in 1950 to manage, produce, and stock native coaster brook trout and lake trout from native Great Lakes strains. This program is part of the interagency restoration programs coordinated through the Great Lakes Fishery Commission, and is based on a strategic plan for management of Great Lakes Fisheries.	$18,205,000

Program name	Purpose	Program expenditures (1992-2001)[a]
New York State Canal System Aquatic Nuisance Species Program	This is a multifaceted program started in 1998. It includes various components to address aquatic invasive species issues within the Canal system. It seeks to work with partner agencies to detect, monitor, and manage populations of aquatic invasive species inhabiting or transiting the Canal and implement prevention strategies as appropriate.	$221,342[c]
Department of Interior-National Park Service		
Midwest Region - Great Lakes Strategic Plan Activities	The purpose of this 1993-initiated program is to foster research cooperation among state and federal agencies involved with natural resource issues of mutual interest. These issues include aquatic exotic species, such as the sea lamprey, shoreline stabilization and monitoring, bald eagle monitoring, near shore fisheries, beach nourishment and fecal coliform issues, air quality, and cultural resource issues.	$6,127,000[c]
Environmental Protection Agency		
Integrated Atmospheric Deposition Network	This program, initiated in 1990, assesses the health of the Great Lakes ecosystem through a series of air-monitoring stations in cooperation with Canada. It provides information to measure the amounts of chemicals and toxic substances deposited into the Great Lakes through air deposition to establish trend analysis and cause/effect relationships.	[b]
Coastal Environmental Management	The purpose of this program, which started in 1991, is to provide grants that would assist in the preparation and implementation of lakewide management plans and remedial action plans for the areas of concern in the Great Lakes. This program addresses cleanup, restoration, and pollution prevention.	$59,100,000
Funding Guidance - Competitive Grants	This is a grant program in which GLNPO, in concert with Regions 2,3, and 5, funds a consortium of programs, agencies, and public and private institutions for reducing the level of toxic substances in the Great Lakes; protecting and restoring vital habitats; protecting human health; and restoring and maintaining stable, diverse, and self-sustaining populations. This program started in 1993, and it funds research, cleanup, restoration, and pollution prevention activities.	[b]
Great Lakes Air Deposition Grant Program	The goals of the Great Lakes Air Deposition Grant Program are to (1) better understand the impacts of deposition of pollutants to all water bodies in the Great Lakes region, (2) ensure continued progress in reducing sources and loadings of atmospheric deposition to the Great Lakes region, and (3) reduce the environmental and public health impacts associated with air emissions and subsequent atmospheric deposition. This research program began in 1993.	$11,135,500
Great Lakes Binational Toxics Strategy	The purpose of this program, which started in 1997, is to reduce and eliminate persistent toxic substances, especially those that bioaccumulate, in the Great Lakes. The strategy uses pollution prevention as a preferred approach. Research and cleanup are also components of this program.	[b]
Lakewide Management Plans	The purpose of the program is to protect the Great Lakes from beneficial use impairments for the "open waters" of each lake and to develop strategies to improve the environmental health of the lake. This program, initiated in 1987, is a cleanup, restoration, and	[b]

Program name	Purpose	Program expenditures (1992-2001)[a]
	pollution prevention program.	
Monitoring Program	The purpose of this research program, which began in 1975, is to assess the ecosystem health of the Great Lakes. Information is gathered to measure whole lake response to control measures using trend analysis and cause/effect relationships.	[p]
Niagara River and New York State Areas of Concern	The purpose of this program, started in 1987, is to restore and protect the beneficial uses in these areas of concern through a remedial action plan. Cleanup, restoration, and pollution prevention are goals of this program.	$2,086,250
Niagara River Toxics Management Plan	The purpose of this program is to reduce toxic chemical inputs to the Niagara River; achieve ambient water quality that will protect human health, aquatic life, and wildlife; and while doing so, improve and protect water quality in Lake Ontario. This program started in 1987 with the goal of cleanup, restoration, and pollution prevention.	$11,150,000
RCRA Subtitle C State Program Support - Great Lakes Initiative	The purpose of this program, started in 1992, is to assist states in developing and implementing an authorized state hazardous waste management program for the purpose of controlling the generation, transportation, storage, and disposal of hazardous wastes. Cleanup and pollution prevention are the goals of this program.	$22,009,710
State of the Lakes Ecosystem Conference	The purpose of this program, started in 1994, is to assess the ecosystem health of the Great Lakes and to provide information to measure whole lake response to control measures using trend analysis and cause/effect relationships.	[p]

Sources: The Corps, NRCS, NOAA, ATSDR, FWS, NPS, EPA, and GAO.

[a]Unless otherwise noted, the funding figures in this column represent program federal fiscal year expenditures.

[b]This program was authorized by WRDA in 2000, and first funded in 2002.

[c]Thus far, no funds have been expended for this program.

[d]The program was first funded in 1994.

[e]The Great Lakes funding first began in 1994.

[f]The amount expended is for fiscal years 1997 through 2001.

[g]NOAA provides base funding for the facility, which averaged over $6.3 million during the 10-year period, but many other federal and state agencies also provide research funds to the laboratory.

[h]The program is considered Great Lakes specific, but research project results would most likely be applicable both within and outside the basin.

[i]Funding to support this program comes from a portion of the annual allocation received by the lower Great Lakes Fishery Resources Office. The amount received from 1992 through 2001 was $2,770,450.

[j]Funding is for fiscal years 2000 and 2001 only.

[k]According to FWS, the authorizing act expires in 2004.

[l]Partial funding for fiscal years 1997 through 2001.

[m]Funding is for fiscal years 1995 through 2001, funding was first provided in 1995.

[n]Funding provided for fiscal years 1998 through 2001.

[e]This is not total funding; expenditures were not available for three known units.

[f]This is a GLNPO program. Funding for GLNPO programs was not available individually. Total GLNPO funding for 1993-2001 is $143,400,000.

[g]Funding provided for fiscal years 1993-2001.

Table 8 contains a listing of the state programs that specifically fund activities in the Great Lakes Basin.

Table 8: State Great Lakes Specific Programs

Program name	Purpose	Program expenditures (1992-2001)[a]
Illinois Environmental Protection Agency (IEPA)		
Illinois Great Lakes Protection Fund (GLPF)	The governors of the eight Great Lakes states created an endowment fund program in 1989. States contributed to the fund and received dividends to use for their Great Lakes projects. The Illinois GLPF program funds special studies and projects related to Great Lakes research, cleanup, restoration, or pollution prevention. The projects are selected as part of the states' budget process.	$5,000,000
Michigan Department of Environmental Quality (MDEQ)		
1988 Quality of Life Bond Fund	This $660 million general obligation bond program was initiated in 1988 to finance environmental programs focused on cleanup of toxic and other contamination sites. It provided funds to address problems relating to solid waste, sewage treatment and water quality, reusing industrial sites, and preserving green space. Funded activities included research, cleanup, restoration, and pollution prevention. The program was replaced by the Clean Michigan Initiative in 1998.	$492,000,000[c]
Clean Michigan Initiative	Michigan voters approved this $675 million general obligation bond program for environmental activities in 1998 to replace the Quality of Life Bond Fund. It is used for cleanup, restoration, or pollution prevention projects, and a portion of the fund is available for parks and monitoring activities.	$255,900,000[d]
Michigan Great Lakes Protection Fund (GLPF)	By mandate, Michigan's GLPF program only funds research projects undertaken by universities and for-profit groups in areas such as toxics and aquatic nuisance species. The research project agenda is determined each year by a MDEQ Technical Advisory Board and may be based on legislative direction, recommendations from MDEQ departments, or current environmental issues, such as ballast water.	$5,199,601[f]
Part 201 Programs	This is the state's version of the federal Superfund program that started in 1995. Its funding is provided by the state Cleanup and Redevelopment Fund, the Revitalization Revolving Loan Fund, the State Site Cleanup Fund, and the Municipal Landfill Cost-Share Grant Program. It can be used to fund research, cleanup, restoration, or pollution prevention.	$169,000,000
Michigan Department of Natural Resources (MDNR)		
Fisheries Research in Great Lakes and Inland Waters	This program funds research projects on fisheries populations, habitats, and anglers. The Fisheries Division of MDEQ began	*

Program name	Purpose	Program expenditures (1992-2001)[a]
	funding this research in the 1930s, and overtime it has grown in scope, with Great Lakes fisheries research stations opening in the early 1970s.	
Minnesota State Planning Agency (MSPA)		
Minnesota Great Lakes Protection Fund (GLPF)	By state statute, funds from Minnesota's GLPF can only be spent to protect water quality in the Great Lakes. Grants are awarded to finance projects that advance goals of the binational Toxic Substances Control Agreement and Water Quality Agreement. Projects involve research, cleanup, restoration, or pollution prevention activities.	$987,000[b]
New York Department of Environmental Conservation (NYDEC)		
New York Great Lakes Protection Fund (GLPF)	New York's GLPF program provides for overall intra- and interstate coordination and planning of the state's Great Lakes programs, and is a source of grants for research, data collection, technology development, policy analysis, and public outreach.	$1,494,053[b]
Ohio Department of Natural Resources (ODNR)		
Great Lakes Charter Programs	This suite of programs was created in response to the charter agreement signed by the Great Lakes governors. The purpose of this 1985 initiated program is to administer the Lake Erie-Ohio River Basin diversion and consumptive use permit programs called for under the charter. The program includes a water resource inventory and the Lake Erie Basin plans. Program funds support restoration, planning, and protection activities.	$600,000
Shore Structure Permit Program	Created in the 1930s, this program was transferred to ODNR in 1949 to assist coastal residents and communities in the proper design and construction of structures intended to control erosion, wave action, and flooding along the Ohio shore of Lake Erie. Program officials review construction permits for shore structures and provide technical assistance to shoreline property owners as it relates to structures involving shoreline erosion, lake access, and coastal flooding.	[i]
Submerged Lands Leasing	This program, which was established in 1917, reviews lease applications for the proposed and existing occupation of submerged lands by structures along the coast of Lake Erie. Leasing submerged land enables the state to manage the public trust and protect the rights of shoreline property owners. It provides technical assistance to shoreline property owners regarding shoreline erosion and lake access structures as it relates to flooding and erosion.	$2,084,296[i]
Ohio Environmental Protection Agency (OEPA)		
Ohio Lake Erie Commission/Lake Erie Protection Fund (Ohio Great Lakes Protection Fund - GLPF)	The Ohio GLPF program provides grants to fund research, support cleanup and restoration efforts, and educate nonprofit, government, or public entities seeking to protect or enhance Lake Erie.	$6,943,894
Pennsylvania Department of Environmental Protection (PDEP)		
Pennsylvania Great Lakes Protection Fund (GLPF)	The Pennsylvania GLPF provides grants to fund education, research, and monitoring activities.	$253,721
Pennsylvania's Office of the Great Lakes	This program began in 1995 and was created as the focal point for research, restoration, cleanup, and pollution prevention activities affecting the Great Lakes. This office works with other PDEP	$700,000[k]

Program name	Purpose	Program expenditures (1992-2001)[a]
	offices that provide the projects' funding.	
Wisconsin Department of Natural Resources (WDNR)		
Great Lakes Harbors and Bays Restoration Funding	This 1990 initiated program allows DNR to conduct activities to cleanup or restore environmental areas that are adjacent to, or a tributary of Lake Michigan or Lake Superior, if the activities are included in remedial action plans approved by the department.	$2,316,271
Wisconsin Great Lakes Protection Fund (GLPF)	The Wisconsin GLPF program provides funds to municipalities and other governmental units, groups, nonprofit organizations, universities and others for various projects. Funds are used for (1) implementing activities included in remedial action plans, (2) restoring or protecting fish and wildlife habitats in or adjacent to Lake Michigan or Lake Superior, or (3) planning or providing information related to cleaning up or protecting the Great Lakes.	$2,224,914
Great Lakes Salmon and Trout Stamp Program	This program was created in 1982 to provide funding for projects pertaining to Great Lakes fish stocking programs. The stocking program activities include evaluation, research, or species propagation.	$11,150,000[c]

Sources: IEPA, MDEQ, MDNR, MSPA, NYDEC, ODNR, OEPA, PDEP, WDNR, and GAO.

[a]Unless otherwise noted, the funding figures in this column represent program state fiscal year expenditures.

[b]This figure represents the amount awarded through grants during fiscal years 1993, 1994, and 1998.

[c]This represents funds expended between 1992 and 1997. After 1997, projects were funded from the Clean Michigan Initiative program.

[d]Clean Michigan Program expenditures were from 1999 through 2001.

[e]Program officials were not able to provide research expenditures for this program before 2002.

[f]This figure represents the amount expended for research grants from 1997 through 2001. Grant expenditure data were not readily available for earlier years.

[g]Project funds were first awarded in 1995. Of the amount shown, $537,000 was provided by the GLPF, and the other $450,000 in project costs was provided by other state funding sources.

[h]The program is considered Great Lakes specific, but research project results are primarily applicable only within New York's Great Lakes Basin.

[i]Funds were not available for this program.

[j]Amounts relate to the cost to administer the program; leasing fees cover other program costs.

[k]This figure relates to costs to administer the program since 1995. Program grant amounts were not provided.

[l]Annual expenditures were estimated, but this figure represents total expenditures during the period 1992 through 2001.

Appendix V: Comments from the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
GREAT LAKES NATIONAL PROGRAM OFFICE
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

APR 17 2003

John B. Stephenson, Director
Natural Resources and the Environment
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Stephenson:

Thank you for the opportunity to review the proposed General Accounting Office (GAO) Report *Great Lakes: An Overall Strategy and Indicators for Measuring Progress are Needed to Better Achieve Restoration Goals.* We appreciate your staff's efforts to understand the scope and complexities of the United States Great Lakes Program and we are giving careful consideration to the draft report. Our comments are outlined below. We will provide Congress, GAO, and the White House Office of Management and Budget with a formal response to the final report recommendations.

We agree with the GAO's call for better planning, coordination, monitoring, and the development of indicators for measuring the health of the Great Lakes. EPA's Great Lakes National Program Office (GLNPO) and its partner State, Tribal, and Federal agencies have taken the initiative in these areas to establish the fundamental building blocks for these efforts. I would like to highlight the following four examples of this work: the establishment of the United States Policy Committee (USPC), the State of the Lakes Ecosystem (SOLEC) Indicators development process, the release of the USPC's Great Lakes Strategy 2002, and the development of the multi-partner Lakewide Management Plans.

In the report, GAO identifies language in Section 118 of the Clean Water Act which identifies GLNPO's coordinative responsibilities for improving Great Lakes Water Quality. GLNPO responded to this charge by convening the USPC which is comprised of federal, state, and tribal agencies with significant natural resource and environmental protection authorities and responsibilities. While the formation and operation of the USPC is not backed by a statutory mandate, it has become an effective vehicle for formulating and implementing priorities of basin-wide significance for the Great Lakes.

One of the major outcomes from formation of the USPC is the Great Lakes Strategy 2002, in which GLNPO played a strong leadership role, which coordinates and streamlines efforts of the many governmental partners involved with protecting the Great Lakes. The Strategy serves an important planning and coordination function by focusing on multi-lake and basin-wide environmental issues, and establishes common goals that the governmental partners will work

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toward. It also advances the implementation of the United States responsibilities under the Great Lakes Water Quality Agreement of 1987.

The Strategy supports existing efforts underway, including the Lakewide Management Plans (LaMPs) and the Remedial Action Plans (RAPs) for Areas of Concern, by addressing issues that are beyond the scope of these programs, and helping integrate them into an overall basinwide context. It is important to recognize that LaMPs and RAPs work at more focused geographical scales and are also important mechanisms to coordinate priorities and actions for the Great Lakes.

We view the Great Lakes Strategy as making significant progress in Great Lakes planning and coordination, due to its scope and the number of participating agencies. We believe the Strategy has helped the Great Lakes Program meet and exceed the requirements for coordination specified in Section 118 of the Clean Water Act. The Act calls for the development of plans, programs, and demonstration projects for nutrient management and the control of toxics pollutants. The Great Lakes Strategy incorporates these areas and also addresses invasive species, habitat protection and restoration, sustainable land use, brownfields redevelopment, minimizing wet weather events, safe beaches, and implementing best management practices on agricultural lands. These are areas crucial to Great Lakes protection and restoration, but which are not specified in Section 118. It is our view that the long term basin-wide goals, objectives, and environmental indicators in the Strategy can form a solid foundation for any future ecosystem restoration plan for the Great Lakes.

One other product created by the USPC, in coordination with our Canadian colleagues, under the auspices of the Binational Executive Committee (BEC), is the State of the Lakes Ecosystem (SOLEC) Indicators development process. This unprecedented binational effort, which involves many public and private stakeholders, is helping the USPC and BEC member agencies create a suite of the environmental indicators necessary and sufficient to inform management decisions. GLNPO has consistently supported the SOLEC effort and will continue to do so contingent on available resources.

While we can improve upon the delivery and coordination of our programs, the scope, geographic scale, the remedial costs involved, and the interwoven complexities of the environmental issues impacting the Great Lakes require long-term, complex solutions implemented at a variety of levels and by many partners. The implementation can be further complicated by the multi-media nature of the problems encountered and the inter-agency, inter-jurisdictional, and international coordination required to implement these actions. Despite this situation, we continue to make significant environmental progress in the Great Lakes.

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In closing, I want to reiterate EPA's strong commitment to the restoration and protection of the Great Lakes. We have many significant accomplishments that have improved environmental conditions and we recognize that the GAO conclusions and recommendations can help ensure that even more environmental improvements are made.

I appreciate the opportunity to coordinate with your staff on this project and look forward to offering detailed responses to the recommendations contained in the report. Should you need additional information or have further questions, please contact Mr. Gary Gulezian, Director of EPA's Great Lakes National Program Office, at 312-886-4040.

Very truly yours,

Thomas V. Skinner
Great Lakes National Program Manager

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Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

John Wanska (312) 220-7628

Staff Acknowledgments

In addition to the name above, Willie Bailey, Heather Holsinger, Stephanie Luehr, Karen Keegan, Jonathan McMurray, and Rosemary Torres Lerma made key contributions to this report.

TESTIMONY OF ROBYN THORSON, REGIONAL DIRECTOR, U.S. FISH AND WILDLIFE SERVICE, BEFORE THE SUBCOMMITTEE ON OVERSIGHT OF GOVERNMENT MANAGEMENT, THE FEDERAL WORKFORCE AND THE DISTRICT OF COLUMBIA, REGARDING GREAT LAKES RESTORATION AND MANAGEMENT

July 16, 2003

Mr. Chairman and Members of the Subcommittee, I am Robyn Thorson, Regional Director of the U.S. Fish and Wildlife Service's (Service) Midwest Region – a bureau within the Department of the Interior. I am pleased to appear before you today to discuss the role of the Service in Great Lakes restoration. My statement will address the Service's responsibilities and authorities for the Great Lakes, outlining the Service's support for and contributions to a comprehensive strategy for the Great Lakes; our participation in programs to develop and enhance environmental indicators in the Great Lakes ecosystem; and this agency's continuing work to meet restoration goals for the benefit of fish, wildlife, and the people of this country.

The Service is the primary federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats. In this capacity, the Service takes great interest in Great Lakes restoration, and accordingly, the Government Accounting Office's report (Report) on the subject. Compiling of the report provided the Service the opportunity to provide information on several relevant issues, including: our existing strategies and partnerships in the Great Lakes; our role in developing and supporting environmental indicators of this ecosystem through our engagement with the Environmental Protection Agency's (EPA) Great Lakes National Program Office, the U.S. Policy Committee, and the State of the Lakes Ecosystem Conference (SOLEC) initiatives; and our efforts to restore fish and wildlife resources, as mandated by the Service's mission and the Great Lakes Fish and Wildlife Restoration Act.

The Service's mission calls on us to work with others to conserve, protect and enhance fish, wildlife, and plants and their habitats, for the continuing benefit of the American people, and this agency depends on legislation such as the Great Lakes Fish and Wildlife Restoration Act and the Great Lakes Legacy Act to carry out that mission. The Service agrees with the Report that planning is critical to our goals, and we strive to implement strategies, programs and partnerships with Great Lakes states, tribes, the Great Lakes Fishery Commission, the Great Lakes Fishery Trust, the Great Lakes Commission, the Northeast-Midwest Institute, and others to achieve this purpose.

Let me provide some examples. The bi-national sea lamprey control program represents an effective, comprehensive strategy contributing to restoration goals for the Great Lakes.

This is administered through the Great Lakes Fishery Commission and implemented by the Service, the U.S. Geological Survey, Canada's Department of Fisheries and Oceans, and many other partners. In operation since 1955, this program is delivering effective control of one of the most damaging invasive species in North America.

Additionally, the Service is signatory to the Joint Strategic Plan for Management of Great Lakes Fisheries, originally adopted in 1981, along with state, provincial, federal, and tribal agencies from the United States and Canada. The Joint Strategic Plan provides an effective framework for strategic planning and management of Great Lakes fish communities, for linkages between fisheries and environmental management, and for accountability among signatory agencies. Under the Joint Strategic Plan, agencies have developed consensus-based objectives for the structure of each of the Great Lakes fish communities, and means of measuring progress toward their achievement. This process further guides the development of species-specific restoration plans and agency operational plans for Great Lakes fisheries. The success of operating under the Joint Strategic Plan is evident on Lake Superior, where lake trout populations have been largely restored, and restoration of coaster brook trout and their habitats is well underway.

Likewise, the Great Lakes Fish and Wildlife Restoration Act, initially authorized by Congress in 1990, has enabled the Service to facilitate partnerships with a wide range of federal, state, and local governments and private partners, as well as Canada, to achieve a basin-wide comprehensive program to assess the ecological status of the Great Lakes. The Service is currently preparing a report to Congress covering our activities under the Act from 1998 through 2002.

Finally, the Service directly assists private landowners, townships, county governments, and others with projects that benefit fish and wildlife resources. Through our Partners for Fish and Wildlife Program, the Coastal Program and Fish Passage Program, the Service provides technical and funding assistance for locally led projects. These programs represent direct implementation of Great Lakes priorities that have positive, local impacts.

The Service is committed to working with our partners in the continuing effort to enhance and restore the natural resources of the Great Lakes ecosystem. To that end, the Service is involved in a host of programs with our partners to improve the ecological health of the system. To address the issue of chemical contaminants as ecological stressors in the Great Lakes, the Service plays a unique role, using principles of ecotoxicology and ecological risk assessment to determine actual or likely effects of contaminants on fish and wildlife. We assist response agencies, including the EPA and state counterparts, in identifying appropriate remedies and we conduct natural resource damage assessments and seek damages to fully restore resources at sites where remediation is complete.

We are often called upon to support protection of ecologically important coastal areas and wetland restoration, and elimination or modification of barriers to allow passage of fish in Great Lakes waterways. To address chemical pollutants in the Great Lakes

system, we promote best land use management practices in the watershed, increased efforts to clean up contaminated sediments in Great Lakes bays, harbors and estuaries, and closer coordination among resource management and clean-up agencies to identify sources and effects of pollution and achieve effective cleanup and restoration.

Among the most critical threats to the Great Lakes is that posed by invasive species. Our efforts, and those of our partners and the National Invasive Species Council, are focused on control of existing problems such as sea lamprey, zebra mussel, as well as the threat that Asian carp may pose to the Great Lakes as they appear to be moving up through the Mississippi River system. Construction of the electric barrier in the Illinois waterway is one example of a partnership effort to control invasive species and protect the waters and habitats of the Great Lakes.

In closing, Mr. Chairman, the Service agrees that there must be a comprehensive strategy to achieve restoration in the Great Lakes, and that environmental indicators and a monitoring system must be part of any plan to achieve success. Already in place are models for these recommendations, including the Sea Lamprey Control Program, Great Lakes Fish and Wildlife Restoration Act and the indicator frameworks developed under SOLEC. The Service is committed to working with its many partners to carry out a comprehensive program to restore the fish and wildlife resources of the Great Lakes and to enhance and restore the health of this ecosystem. The system faces many threats – from invasive species to contaminants to loss of coastal habitats. The Service stands ready to continue its leadership role in fish and wildlife restoration and to expand its work with partners to make the world's largest freshwater ecosystem a balanced and healthy environment.

This concludes my testimony. I appreciate the opportunity to appear before the Subcommittee, and I would be pleased to answer any questions you have.

STATEMENT OF
THOMAS V. SKINNER
REGION V ADMINISTRATOR
NATIONAL PROGRAM MANAGER FOR THE GREAT LAKES
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON OVERSIGHT OF GOVERNMENT MANAGEMENT, THE FEDERAL WORKFORCE AND THE DISTRICT OF COLUMBIA
OF THE
COMMITTEE ON GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

July 16, 2003

Good Morning, Mr. Chairman and members of the Subcommittee. I am Tom Skinner, the U.S. Environmental Protection Agency's (EPA's) Region V Administrator and the National Program Manager for the Great Lakes. I am pleased to be here today to discuss the recent General Accounting Office (GAO) report, our programs and the progress that has been made in protecting this Nation's irreplaceable Great Lakes ecosystem.

INTRODUCTION

I want to first take this opportunity to strongly reaffirm EPA's commitment to the Great Lakes, the U.S.-Canada Great Lakes Water Quality Agreement (GLWQA, or "the Agreement"), and our role and responsibilities set forth for the Great Lakes National Program Office (GLNPO) under Section 118 of the Clean Water Act (CWA). The CWA requires EPA, and more specifically GLNPO, to serve as the lead entity for coordinating the protection and restoration of the Great Lakes system with the appropriate Federal and provincial agencies in

Canada. The Act gives EPA a leadership role in coordinating Great Lakes issues nationally with other Federal agencies, the eight Great Lakes States, and Tribal authorities.

EPA and GLNPO have made significant progress, along with our partners. Over the past few years, we have built a sound structure for achieving a collective vision of comprehensive ecosystem management for the Great Lakes, using an adaptive management approach. The Great Lakes system is not static, and we must adapt to the ever-changing challenges of protecting this magnificent resource, which contains 20% of the world's fresh surface water.

The Great Lakes region is both environmentally and institutionally complex and has an important international dimension. Working together, the Great Lakes governmental partners have, with Canada's involvement, found innovative solutions to such problems as cleaning up contaminated sediments, reducing persistent, bioaccumulative chemicals, and stemming the tide of invasive species.

THE GAO REPORT

The April 2003 GAO Report, entitled "Great Lakes: An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals," made a number of recommendations, many of which we agree with, but

a few of which we do not. EPA will be submitting its formal response to the GAO report later this month.

COORDINATION OF GREAT LAKES ACTIVITIES

I would like to take this opportunity to outline what EPA, along with its partners, is doing with regard to coordination. I will highlight the programs and coordinating mechanisms we are using to effectively manage the Great Lakes program to achieve environmental results, and to ensure this magnificent resource is protected now and for future generations.

Binational Executive Committee

The first area I would like to highlight are the mechanisms that are used to coordinate programs and priorities for the Great Lakes. Over a decade ago, EPA led the effort to develop an executive level forum, the Binational Executive Committee (BEC), which is comprised of senior-level representatives of Canadian and U.S. Federal, State, provincial agencies, Tribes and First Nations, who are accountable for delivering major environmental and natural resource programs and activities that respond to the terms of the GLWQA. The purposes of the BEC, which meets twice a year, are to:

- set priorities and strategic direction for binational programming in the basin;
- coordinate binational programs and activities;

- respond to new and emerging issues on the Great Lakes including tasking existing or creating new working groups to undertake designated activities;
- evaluate progress under the GLWQA, and;
- provide advice, comment or other input for the preparation of various binational reports and presentations.

The BEC has been instrumental in coordinating and managing Great Lakes programs on a binational basis. At a meeting in Chicago earlier this month, the BEC met to discuss important topics such as the Lake Erie Study, and progress on Great Lakes indicators, including air deposition monitoring. EPA has been delegated the responsibility for overseeing the implementation of the GLWQA by the U.S. State Department. These meetings are called for under Article X of the Agreement. The State Department is invited to these meetings and has been present when major issues of binational significance have been discussed.

U.S. Policy Committee

With the Binational Executive Committee in place to address and coordinate the Parties' activities under the Agreement, there existed a specific need to achieve better coordination of policy development, planning, management, and technical activities across the diverse number of U.S. organizations. For this purpose, at the domestic level, the U.S. Policy Committee (USPC) was established in the early 1990's and its role and charter

were renewed in 2001. The USPC concentrates on basin wide activities on the U.S. side of the border, and on formulating and representing U.S. views in binational fora, such as the BEC and the International Joint Commission (IJC).

The USPC is comprised of senior level managers from various Federal, State and Tribal agencies. It uses collaborative methods of operation, and has bi-annual meetings to track progress and coordinate programs and priorities for Great Lakes basin issues. It recently met in May in Ohio and is actively overseeing such initiatives as implementation of the Great Lakes Strategy 2002, the Sanitary and Ship Canal barrier near Chicago, and other invasive species efforts, as well as U.S. progress on Areas of Concern.

Early in 2000, the U.S. Policy Committee clearly understood the need to develop a basin-wide vision of the goals, priorities, and key activities that would be needed to protect and enhance the Great Lakes. To ensure success, it is critically important that all the Agencies, and their appropriate authorities and resources come to bear on solving the problems. It was clear that much progress had been made, but the Great Lakes were suffering from new threats, and a renewed partnership was needed.

The Great Lakes Strategy 2002

One product of the U.S. Policy Committee I would like to highlight today is the Great Lakes Strategy 2002. After over two years of coordinating work, the Great Lakes Strategy 2002 was released by former Administrator Whitman in

Muskegon, Michigan, on behalf of the U.S. Policy Committee. The strategy was developed with important stakeholder input. Public meetings were held across the basin in Duluth, Detroit, Chicago, and Niagara Falls, and over 2,000 comments from the public were considered in the development of the Strategy.

We heard a strong, collective voice advocating for a cleaner Great Lakes where we could eat the fish, drink the water, and swim at the beaches. Everyone wants the Great Lakes to be a healthy place for people and wildlife. Simple, but profound messages. We heard this resoundingly, and made these the centerpiece for the vision of our plan.

The plan is groundbreaking in that it includes major objectives that are measurable and time phased. It includes over 120 supporting key actions that need to be carried out by the various partners to the plan. Ten Federal agencies, eight Great Lakes States, and Tribal authorities assisted in its development through a consensus based process undertaken by the Policy Committee.

We are now in the process of implementing the strategy and tracking progress. Some of the key goals in the strategy are:

- By 2005, clean-up and delist 3 Areas of Concern, with a cumulative total of 10 by 2010.
- By 2007, reduce concentrations of PCBs in lake trout and walleye by 25% from 2000 levels.
- By 2007, establish 300,000 acres of buffer strips in agricultural lands.
- By 2010, open 90% of Great Lakes beaches for 95% of the season.

- By 2010, restore or enhance 100,000 acres of wetlands in the Basin.
- By 2010, substantially reduce the further introduction of invasive species, both aquatic and terrestrial, to the Great Lakes Basin Ecosystem.
- Accelerate the pace of sediment remediation, leading to the clean-up of all designated sites by 2025.

Development of Lakewide Management Plans

Another way that EPA is taking leadership is in the development of Lakewide Management Plans, or LaMPs. A comprehensive management plan has been developed for each Lake, outlining goals and actions needed to protect and restore beneficial uses. These plans serve to bring together key partners and to identify multi -agency actions, resources, and programs that are needed to protect and restore the lakes. They are developed with much stakeholder involvement. We are working closely with the States, other Federal agency partners, and Tribal authorities in their implementation.

Since 2000 we have had plans for each of the Great Lakes that will be updated every two years. These will be used as a blueprint to manage our efforts to improve the conditions of each of the Lakes, which need specifically tailored actions directed at solving each Lake's most significant environmental problems.

Remedial Action Plan Program

Another program I would like to report on is the Remedial Action Plan, or "RAP" program for Areas of Concern (AOC). EPA has already heeded the recommendations contained in GAO's report and is in the process of making improvements to manage this program.

One such effort was the development of a delisting principles and guidance document published by EPA, under the auspices of the Policy Committee in December 2001. It is assisting in developing measurable, locally-driven goals for Areas of Concern that will aid in delisting these sites. Already one U.S. AOC, Presque Isle Bay in Pennsylvania, has been identified as an Area of Recovery. New York State is planning to delist the Oswego River in the near future. We are providing not only leadership but technical assistance for this program. In early June of this year, EPA sponsored a workshop, in partnership with the Great Lakes Commission, that brought participants together from all AOC's to work on furthering progress.

The newly-passed Great Lakes Legacy Act will help advance the clean up of contaminated sediments in the AOC's, moving them even closer to final delisting. EPA is moving forward to implement the Legacy Act and has already held 30 briefings with numerous partners to discuss implementation. We are taking steps to accelerate the pace of sediment clean-ups in the Great Lakes basin.

I would also like to discuss efforts directed at increasing our knowledge base and developing strong scientific underpinnings for the decisions we make to improve our ability to assess environmental progress and conditions for the Great Lakes. While not as "glamorous" as restoring a wetland, or saving an endangered species, the groundbreaking research and monitoring taking place on the Great Lakes is every bit as important.

The State of the Lakes Ecosystem Program

The State of the Lakes Ecosystem Program, also known as "SOLEC," was created under the auspices of the Binational Executive Committee. The concept of a biennial State of the Lakes Ecosystem Conference (SOLEC) to report on the condition of the Great Lakes ecosystem, was created by the BEC to fulfill, in part, the GLWQA requirements for assessing and reporting progress toward the goals and objectives of the Agreement. SOLEC is science-based, and is a collaborative effort between the U.S. and Canada, and between Federal, State, Tribal, provincial and local government agencies, environmental groups, industry and the public.

Four objectives were established for SOLEC: to assess the state of the Great Lakes ecosystem based on accepted indicators; to strengthen decision making and environmental management; to inform local decision makers of Great Lakes environmental issues; and to provide a forum for communication and networking among all stakeholders. The primary audience includes

environmental managers and decision makers, but the information needed by senior administrators and the public is also considered. Four SOLEC reports have been issued since l995, and plans are for the 2003 report to be released next month

Over 800 indicators were initially reviewed by over 130 scientists and other participants. A suite of 80 indicators has been identified as useful in assessing the health of the Great Lakes. We are in the process of prioritizing these 80 indicators and identifying the most critical for decision-making and reporting. These indicators are being used to inform and strengthen our monitoring programs which are the foundation of our science based assessments.

Monitoring

Turning to monitoring, we have a multi-agency system of monitoring for the Great Lakes that involves a variety of expertise. A cost-effective system should be binational in scope, since there are economies of scale using equipment and scientific expertise among the two Nations. Numerous agencies on both sides of the border are contributing toward our monitoring programs, ensuring that the best scientific expertise is applied to the Great Lakes.

Our monitoring and indicators systems are working. For example, through our routine monitoring program, we were able to uncover the re-emergence of the "Dead Zone" in Lake Erie. In response to this information, we have initiated

a binational, multi-agency study on Lake Erie to determine what is causing the problem and the steps we might take to address it. This study will help us to direct management actions at the most cost effective solutions.

CONCLUSION

In my remarks today, I have focused on several of our specific Great Lakes initiatives and programs. As an Agency, however, EPA also administers a number of different environmental statutes, including programs under the Clean Water Act, the Clean Air Act, and Superfund, which are particularly important for obtaining environmental improvements. We are implementing these statutes with an eye towards obtaining on the ground results that will help us reach our Great Lakes goals.

Our programs have achieved measurable results. For example, levels of PCB's in Lake Michigan lake trout have decreased by a factor of 10 since the mid-1970's. Approximately 2.3 million cubic yards of contaminated sediments have been cleaned up in the Great Lakes basin over the past 6 years by U.S. partners. Bald eagle populations have grown to the point that the U.S. Fish and Wildlife Service may be able to remove our national symbol from the list of endangered and threatened species. While these results are impressive, there is still much work to be done.

Improving the management and coordination for the Great Lakes should build on existing plans and institutions. We have a suite of complementary plans that have been developed collaboratively with the participation and input of many Agencies and stakeholders. These plans have actions that are ready for implementation. As we move forward on these plans we will track results, both from environmental and management perspectives.

Of course, as the General Accounting Office notes, we can always improve our efforts to better coordinate and strive for clearer accountability and implementation. We are committed to doing that.

We must view our work in the Great Lakes as leading to continuous improvement, rather than as a static plan or process, as the Great Lakes are a dynamic system. There are over 35 million people in the Great Lakes basin, along with the global community, that are relying on the Agencies in this room to deliver a Great Lakes basin where we can eat the fish, drink the water, and swim at the beaches. We want to make sure that the Great Lakes are a healthy system for both wildlife and people. We want to make sure that future generations can enjoy their beauty and magnificence. We all are stewards towards this end.

I would like to thank you Mr. Chairman, and the Subcommittee for inviting me to speak here today.

* * *

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

COMPLETE STATEMENT

OF

COLONEL WILLIAM E. RYAN III
DEPUTY COMMANDER, GREAT LAKES & OHIO RIVER DIVISION

BEFORE

UNITED SATES SENATE
COMMITTEE ON GOVERNMENT AFFAIRS

SUBCOMMITTEE ON OVERSIGHT OF GOVERNMENT MANAGEMENT, THE FEDERAL WORKFORCE AND THE DISTRICT OF COLUMBIA

ON

GREAT LAKES RESORATION MANAGEMENT: NO DIRECTION, UNKNOWN PROGRESS

JULY 16, 2003

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GREAT LAKES RESTORATION MANAGEMENT: NO DIRECTION, UNKNOWN PROGRESS

Introduction

Mr. Chairman, Committee members, and distinguished guests, I am pleased to testify before you on the restoration of the Great Lakes. The U.S. Army Corps of Engineers (Corps) supports efforts to improve the management of programs for the protection, enhancement and restoration of the Great Lakes environment. The Great Lakes system is one our nation's most vital natural resources. The world's largest freshwater system provides millions of U.S. and Canadian residents water for consumption, transportation, power, recreation, and a number of other uses. I look forward to continuing to work with our sister agencies and other partners on approaches for moving the restoration of the Lakes forward.

I will begin my comments with a response to the recent General Accounting Office (GAO) report on the Great Lakes restoration needs, provide an overview of the Corps' Great Lakes programs, and offer some recommendations on next steps to further enhance the management of Great Lakes programs.

GAO Report Response

The recent GAO report entitled "*Great Lakes: An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals*" (GAO-03-515) includes a description of the Corps of Engineers programs that are available to support environmental protection and restoration in the Great Lakes Basin. We have found the inventory of Federal and State programs for the Great Lakes contained in the GAO report comprehensive and are using it in one of our ongoing studies.

The Corps agrees with GAO that an effort is needed to help coordinate the various restoration programs in the Great Lakes Basin and that a comprehensive monitoring system with selected indicators is necessary to measure progress in restoring the ecosystem of the Great Lakes system.

Federal and Non-Federal Roles

Primacy for water resources management in the U. S. has been and must continue to be at the State and local level. While it is appropriate for the Federal government to be involved in issues of international, national or multi-state significance, such as the management of the Great Lakes water resources, it is the States, and in particular the Governors, who should be establishing the priorities for management of these shared water resources. The scope and technical complexity of water issues and the extent of desired participation by stakeholders mean that the Federal government can facilitate state and local leadership by being responsive to their requests for effective coordination among Federal and non-Federal restoration programs and by bringing Federal analysis and program support to state and local efforts. A comprehensive restoration plan for the Great Lakes Basin can only be developed through a framework of successful partnership and collaboration.

The diversity of environmental issues of the Great Lakes Basin has spawned a number of intergovernmental organizations and committees to coordinate one or more specific issue, whether it is invasive species, wetlands restoration, water management, non-point source pollution, or contaminated sediments. A significant amount of planning and coordination has already been accomplished through these existing organizations and committees, including the U.S. Policy Committee, Great Lakes Commission, Council of Great Lakes Governors, and Great Lakes Fishery Commission.

Integrated and Collaborative Watershed Approach

The environmental issues facing the Great Lakes are numerous and complex. The Great Lakes issues include contaminated sediments, invasive species, non-point source pollution, threatened critical habitat, and water management within a framework of two countries, eight States and two Provinces.

We believe that restoring Great Lakes resources will benefit from a watershed perspective, emphasizing collaboration and integration. Success will require the participation of all interested parties in the planning and decision-making process. This participation would foster an open dialogue to integrate sometimes competing or conflicting water resource needs. Such integration and collaboration are indispensable to meeting water challenges.

Overview of Corps Great Lakes Programs

The Corps has a variety of Civil Works programs that are being utilized for the protection, enhancement and restoration of the Great Lakes ecosystem. The size and importance of this water resource and the complexity of the challenges before it necessitate a team approach to its management. The Corps has worked as a team

member, as well as team leader, in different aspects of the collective environmental programs for the Great Lakes Basin.

The Corps has been a member of the team that monitors, predicts and regulates water withdrawals, flows and diversions through our support to the International Joint Commission (IJC) Boards of Control and reference studies. The Corps has been a member of the U.S. Policy Committee, and participated in the development of their Strategic Plan to facilitate the implementation of the Great Lakes Water Quality Agreement. The Corps has provided technical assistance to the U.S. Environmental Protection Agency (EPA) in the development of Lakewide Management Plans (LaMPs). The Corps has also provided technical assistance to States and local groups for the development and implementation of Remedial Action Plans (RAPs) at sixteen of the Great Lakes Areas of Concern (AOCs).

The Corps has been a leader of team efforts to protect and restore the Great Lakes ecosystem from invasive species, including the dispersal barrier on the Chicago Sanitary and Ship Canal and sea lamprey barriers at various Great Lakes tributaries. The Corps is also leading the Great Lakes Fishery & Ecosystem Restoration program and other programs to restore and enhance aquatic habitat in the Great Lakes Basin in partnership with the Great Lakes Fishery Commission, Great Lakes States and Tribes.

Perhaps the most significant program the Corps has led to date is the removal and confinement of contaminated sediments from Federal navigation channels in the Great Lakes. Although this program was conceived as a measure for environmental protection rather than restoration, the Corps, in partnership with state and local governments has removed over 90 million cubic yards of contaminated sediments from the Great Lakes through this program. Over 70 million of that was from Great Lakes AOCs. Using its expertise in management of contaminated sediments, the Corps has been working with other Federal agencies and Great Lakes states on sediment cleanup projects. The Corps continues to work in partnership with the EPA to evaluate and demonstrate new and improved technologies for managing contaminated sediments.

Through a more recent program, the Corps is currently leading projects for environmental dredging at eight Great Lakes AOCs in partnership with State and local agencies.

The Corps conducted one the first ecosystem restoration plans for Lake Erie in cooperation with the EPA approximately 30 years ago and is conducting watershed management planning for what some call the sixth Great Lake, Lake St. Clair, in partnership with Federal, State and local agencies.

The Corps has four basinwide studies ongoing that are addressing specific or general water resource needs of the Great Lakes. The first of these is a U.S.-Canadian collaborative study of the existing navigation infrastructure in the Great Lakes and St. Lawrence Seaway. We are working with the U.S. Department of Transportation, Transport Canada, and the U.S. and Canadian Management organizations for the St. Lawrence Seaway to establish the baseline conditions of the existing infrastructure,

commercial navigation use, and the environmental conditions of the Lakes and St. Lawrence River that may be impacted by the navigation system.

The second basinwide study is an inventory of biohydrologic information relevant to Great Lakes water management and will include a gap analysis of water-related data. This study is closely integrated with the Annex 2001 activities of the Great Lakes Governors.

The third basinwide study we have initiated in partnership with the Great Lakes States is an evaluation of the economic benefits of recreational boating in the Great Lakes, in particular those utilizing the Federal navigation system.

The fourth Great Lakes study the Corps is helping to develop a strategic plan in collaboration with the Great Lakes Commission. As authorized in Section 455(a) of the Water Resources Development Act of 1999, this study will produce a report to Congress with an analysis of existing water resource needs identified by Great Lakes States and stakeholders and recommendations for new or modified authorities to address unmet needs. As I mentioned, we are using the inventory of programs provided in the GAO report in this study.

Conclusion

The Corps is pleased to have had the opportunity to appear before you and provide testimony on this important subject. We value highly the water resources of the Great Lakes, the partnerships we have formed with our sister Federal agencies, the Canadians, the Great Lakes States, Tribes, local governments and stakeholder groups in managing and protecting this unique resource.

The Corps looks forward to continuing these partnership efforts to help restore the ecosystem of the Great Lakes basin. Mr. Chairman, this concludes my remarks. I would be happy to answer any questions.

WRITTEN TESTIMONY OF

TIMOTHY R.E. KEENEY
DEPUTY ASSISTANT SECRETARY FOR COMMERCE FOR OCEANS AND ATMOSPHERE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

BEFORE THE

SUBCOMMITTEE ON OVERSIGHT OF GOVERNMENT MANAGEMENT, THE FEDERAL WORKFORCE, AND THE DISTRICT OF COLUMBIA
COMMITTEE ON GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

July 16, 2003

I. INTRODUCTION

Mr. Chairman, and Members of the Subcommittee, good morning, and thank you for inviting me to discuss efforts to restore the Great Lakes. I am Tim Keeney, the Deputy Assistant Secretary of Commerce for Oceans and Atmosphere. The Great Lakes are one of the earth's greatest treasures and the Nation's single most important aquatic resource from an economic, geographic, international, ecological, and societal perspective. Today, I will focus my remarks on two areas: the National Oceanic and Atmospheric Administration's (NOAA) response to the recent Government Accounting Office (GAO) report, and NOAA's programs related to restoration efforts in the Great Lakes.

Many complex challenges lie ahead for the Great Lakes. The Great Lakes continually face extremes in natural phenomena such as storms, erosion, high waves, high and low water levels, and climate variability, all of which influence efforts to restore habitat.

Population growth in the region will continue to increase stresses on the Great Lakes, adding to the complexity of management issues. The one thing that we can predict with near certainty is that the Great Lakes ecosystem will continue to change and pose a challenge for effective use and management.

In the early 1970s when Lake Erie was declared dead, the solution, based on best available science, was relatively clear: nutrient loading must be reduced. Our ecological understanding and technological know-how have significantly improved since the 1970s. It is clear that future successes will depend on a holistic, ecosystem approach.

II. NOAA's RESPONSE TO THE GAO REPORT

NOAA shares the concerns raised in the recent GAO report *The Great Lakes: An Overall Strategy and Indicators for Measuring Progress are Needed to Better Achieve Restoration Goals*. NOAA agrees that restoration of the Great Lakes ecosystem is a complex and challenging task. Although many federal, state, and local programs are already working together on this task, better coordination would help all partners to more effectively work together to restore the Great Lakes ecosystem. The complexity of the issue and the large numbers of specific projects that are being developed to address environmental problems in the Great Lakes have complicated tracking of progress toward achieving restoration goals. Improving the consistency of performance metrics among the agencies involved, and better coordination of monitoring programs would provide information necessary for reliably evaluating progress toward regional restoration goals.

III. NOAA's ONGOING EFFORTS IN THE GREAT LAKES

NOAA has environmental stewardship, assessment, and prediction responsibilities in the Great Lakes. NOAA conducts physical, chemical, and biotic research and environmental monitoring and modeling, providing scientific expertise and services to manage and protect Great Lakes ecosystems. Research helps to improve the understanding and prediction of coastal and estuarine processes, including the interdependencies with the atmosphere and sediments. Specifically, NOAA:

- Predicts impacts of pollution and coastal development on sensitive habitats and resources, including maintaining contaminant-monitoring sites in Green Bay, and Lakes Michigan, Huron, St. Clair, Erie and Ontario to determine contaminant trends;
- Works with states to analyze changes in coastal land cover and plan habitat restoration and conservation;
- Collects, analyzes and distributes historical and real-time observations and predictions of water levels, coastal currents and other meteorological and oceanographic data;
- Provides scientifically sound information on ecosystem processes to improve management decisions and mitigate human impacts;
- Develops and implements techniques and products to improve severe storm forecasting, and provides the weather and flood warnings, forecasts, and meteorological and hydrologic data used by research, environmental management, transportation, and community interests in the Great Lakes;

- Provides surveying, nautical charts, and other navigation services for safe shipping and boating;
- Acts on behalf of the Secretary of Commerce as a natural resource trustee for the public to protect and restore aquatic species and their habitat; and associated services such as safe navigation and transportation, recreation, commercial fishing, shoreline stabilization, and flood control;
- Partners with universities through the National Sea Grant College Program and the Great Lakes Environmental Research Laboratory to encourage stewardship of Great Lakes coastal natural resources by providing funding to and conducting joint projects with area universities for research, education, outreach and technology transfer; and,
- Partners with state Coastal Zone Management programs to work with local communities and state agencies to preserve, protect, develop, restore, and enhance coastal zone resources, providing research, education, and protection of coastal and estuarine areas.

My testimony today provides examples of NOAA activities that relate to habitat restoration - an agency priority. NOAA's restoration role includes advising on cleanup of contaminated sites, working with states and others to fund habitat restoration projects, and conducting research and monitoring activities.

The issues involved in large contaminated sediment sites are multifaceted and often controversial, resulting in assessments and cleanups that can take ten or more years to

complete. NOAA works with our partner agencies to promote remedies that will protect the aquatic environment, build restoration into clean up actions, and reduce overall injury to natural resources to speed their recovery. By working cooperatively at sites with cleanup and trustee agencies, local groups, and potentially responsible parties, NOAA decreases contaminant loads, reduces risks to protect sensitive species, and improves and restores habitat function. In addition to cleanup, there is often a need to restore natural resources that have been injured by contaminant releases. This can be accomplished through NOAA's trustee authority to cooperatively address liability, to assess natural resource damages, and to restore natural resources. NOAA is currently working on cleaning up and restoring 18 hazardous waste sites in the Great Lakes region.

NOAA partners with state governments through the Coastal Zone Management program, a unique federal-state partnership that provides a proven basis for protecting, restoring, and responsibly developing the Nation's important and diverse coastal communities and resources. A major premise of the Coastal Zone Management Act is that the management of uses and resources of the coastal zone is best achieved at the state and local level. Great Lakes state Coastal Zone Management programs support and coordinate with local governments, tribal agencies, and community organizations on developing watershed management plans and protecting and managing critical coastal areas, such as coastal wetlands. These existing relationships could be used to involve local stakeholders in a Great Lakes regional restoration plan. All of the states in the Great Lakes, with the exception of Illinois, have federally-approved Coastal Zone Management programs. An example of current restoration efforts is the Great Lakes Coastal Restoration Grant

program, which was funded through a $30 million appropriation in fiscal year 2001. More than 70 local government units have partnered in this program and are working on a variety of restoration projects, including contaminated sediment cleanup, invasive species removal, dune and marsh restorations, acquisition of critical habitat, and storm water management projects.

NOAA's Great Lakes Environmental Research Laboratory conducts a variety of research applicable to restoration and coordinates significant intergovernmental issues. NOAA's partnership with Sea Grant Colleges, government, and the private sector offers an integrated program of research, education, and technical assistance that promotes the restoration of degraded coastal habitat. Overall NOAA activities include wetlands banking, rehabilitation of Brownfields sites, beach stabilization and restoration, establishing protected areas, using dredged material to enhance fish and wildlife habitat, improving water quality, fisheries management, and prevention of invasive species. NOAA Sea Grant scientists develop and implement methods to restore habitat and extension agents empower coastal communities to undertake well-planned coastal development that preserves and promotes restoration of critical coastal habitats. For example, Wisconsin's Brown County, with funding from the U.S. Army Corps of Engineers, is rebuilding the Cat Island chain of barrier islands in Green Bay to restore these important habitats for fish and wildlife. Sea Grant habitat restoration and coastal engineering specialists have provided habitat designs, identified potential water quality impacts, and helped determine acceptable PCB levels in the dredged material used for construction of the islands.

NOAA conducts a variety of research and monitoring applicable to restoration and coordinates activities on significant intergovernmental issues. An example of coordinated research is the NOAA National Center for Aquatic Invasive Species Research, currently being established to develop a coordinated NOAA research plan to address invasive species issues. The Center will foster partnerships among NOAA, other agencies, universities, and private sector entities to address prevention, early detection, rapid response, and management of invasive species, a major restoration issue for Great Lakes ecosystems.

NOAA also provides monitoring and other information useful for evaluating restoration needs and success. For example, NOAA's Mussel Watch Program analyzes contaminant levels in mussel tissue and sediments as a means of tracking the health of Great Lakes ecosystems. NOAA is also developing land cover data for the entire coastal zone of the U.S. Great Lakes. The land cover data are being developed for 2001, along with retrospective land cover for 1996, to identify changes in the landscape. These regional data sets can help coastal managers monitor urban sprawl and changes to natural resources, inventory wetland and wildlife habitat, and develop trend analyses.

The Estuary Restoration Act was passed in 2001 to facilitate coordination among federal and private entities that conduct restoration activities. The Interagency Estuary Habitat Restoration Council (consisting of delegates from each of five agencies: EPA, NOAA, Department of the Army, Fish and Wildlife Service, and Department of Agriculture)

administers the directives of the Estuary Restoration Act (ERA). The nearshore waters and coastal wetlands of the Great Lakes are classified as estuary habitats under the ERA, and are therefore eligible for estuary habitat restoration program funding. As part of its responsibilities under the ERA, NOAA is developing monitoring protocols to better assess the success of restoration projects and a national database of restoration projects. This database will include information on project goals, restoration techniques, and monitoring results, and will be publicly accessible over the internet in the fall of 2003.

NOAA has recently awarded two grants that will further restoration planning for the Great Lakes. Under these grants, the Great Lakes Commission and the Northeast-Midwest Institute, in partnership with the Great Lakes Sea Grant Network, will provide technical and scientific support to the Region's leadership in the development of a comprehensive ecosystem restoration plan. The Institute will review the approaches that other regions have used to launch major ecosystem restoration initiatives in order to provide guidance for Great Lakes planning efforts. The Commission will facilitate a series of state and province focus groups culminating in a Great Lakes Restoration forum that will identify restoration priorities and associated strategic actions. This effort will help unify the many existing strategic plans from partner agencies. NOAA looks forward to working in partnership with EPA, states, and others in this effort.

As part of our responsibilities under the Estuary Restoration Act, NOAA is producing guidance for monitoring restoration projects that should be applied to restoration efforts in

the Great Lakes. These monitoring protocols include a core set of indicators of ecosystem function specific to each habitat type to allow an accurate evaluation of restoration results.

NOAA is currently working with coastal states to develop a national coastal management performance measurement system. The first phase of the project, a national framework, was completed in June of this year. A joint state-federal working group has been established to identify specific indicators that will show the results of coastal management efforts in the states. NOAA will report to Congress on the status of the proposed performance measurement system in December 2003.

Thank you again for inviting me to present this overview of NOAA's current contributions to restoring Great Lakes ecosystems. I would be happy to answer any questions you might have.

The Honorable Dennis Schornack
Chairman, U.S. Section, International Joint Commission
Remarks before the Subcommittee on Oversight of Government Management, the Federal Workforce and the District of Columbia
Wednesday, July 16, 2003

Thank you, Chairman Voinovich, for the opportunity to address the complex and vitally important issue of managing the restoration of the Great Lakes. In fact, restoring the greatness of the lakes is the top priority of the International Joint Commission under the terms of the reference articulated in Article VII of the Great Lakes Water Quality Agreement.

Before I dive in to the details, I should note that I have the honor of being accompanied today by the Rt. Honorable Herb Gray, my co-chair at the IJC and the former deputy prime minister of Canada. And my remarks today reflect my sentiments as Chair of the U.S. section and not necessarily those of the entire commission.

Let me also say a word about the role of the IJC. Created by the Boundary Waters Treaty of 1909, we prevent and resolve disputes between the United States and Canada regarding our shared waters. We also operate 19 control structures on the shared waterways that traverse over 5,000 miles of the U.S.-Canadian boundary.

The IJC is made up of three commissioners appointed by the President of the United States with the advice and consent of the Senate and three appointed by the Prime Minister of Canada. Commissioners serve as independent watchdogs without instruction from our respective governments. Upon taking office, we take an oath to be independent of the very governments that appointed us and to serve the common good of the citizens of both countries. We operate as a unitary body that utilizes joint fact-finding to make decisions by consensus based on the best available science.

The treaty that created the IJC gave each nation equal rights to use our shared waters, including the Great Lakes, but with those rights came important responsibilities. For example, Article IV stipulates "waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other." In addition, Article VIII sets the order of precedence for the use of boundary waters:

1. domestic and sanitary purposes;
2. navigation, including the service of canals for the purposes of navigation;
3. power and for irrigation purposes.

The IJC's successful work under the Boundary Waters Treaty led the U.S. and Canada to once again turn to the IJC to play a key role in monitoring and assisting in the implementation of the Great Lakes Water Quality Agreement. Specifically, every two years, we evaluate the progress of the two countries in restoring beneficial uses, hold public hearings and issue a comprehensive report. The operating principles of the IJC – our independence, the equality of commissioners and countries, our binational science-based approach and our objectivity – make the IJC the ideal watchdog over the Great Lakes Water Quality Agreement.

For example, the IJC's 11th Biennial Report and the recent special report on the status of restoration efforts in Areas of Concern (AOC) fulfilled our obligation under Section 7 (b) of Annex 2 of the agreement. The AOC report was the first comprehensive look at activities in AOCs since 1994. Our key findings were that a lack of monitoring data, lack of targets and even a lack of something so simple as maps of each AOC made an assessment of progress virtually impossible. Moreover, we found that the countdown to clean – two down, 41 to go – is proceeding too slowly.

The IJC also agreed with a previous report of the GAO and its Canadian counterpart, the Auditor General's Office (AGO), regarding the lack of coordination and the need to set clear lines of authority and accountability in order to properly manage the programs and assess progress towards restoring beneficial uses. Clearly, when three independent agencies from two countries reach one conclusion, the result is a very powerful "triangulation" of opinion that is legitimate and valid. These findings cannot be ignored.

The same conclusion can also be reaching regarding both U.S. and Canadian management of alien invasive species in the Great Lakes – the number one threat to biodiversity in the ecosystem. Again, reports prepared by the IJC, GAO, AGO and others clearly document the lack of a coordinated, focused strategy to combat these invaders who threaten the food web upon which all aquatic life in the Great Lakes depends. Both our ecology and our economy are at serious risk and no one is in charge of solving the problem.

Chairman Voinovich, as you know, it was the "death" of Lake Erie back in the late 1960's that led to passage of the Clean Water Act and the signing of the Great Lakes Water Quality Agreement. Improvements in the treatment of wastewater reduced phosphorus loading, and gave the lake new life. But now, an insidious alien invader, the zebra mussel and nonpoint stressors are contributing to a growing dead zone in Lake Erie. At the same time, the Asian carp is creeping up the Mississippi toward Lake Michigan, posing the biggest threat to Great Lakes fisheries since the sea lamprey. Responding to these challenges demands a unified, binational strategy, an effective and accountable organizational structure to implement that strategy and a budget adequate to the task.

When considering the issue of a coordinated strategy for Great Lakes restoration, the complexity of program management immediately becomes apparent. Just on the U.S. side alone, there are eight states, 13 federal agencies, nearly 200 programs and hundreds of municipal governments and nongovernmental groups involved.

While the Great Lakes Critical Programs Act envisioned the Great Lakes National Program Office (GLNPO) to be the key agency responsible for managing and coordinating restoration programs, the reality is they don't have the power, the budget or the reach to really direct programs over multiple federal agencies and multiple levels of government. So I differ with the GAO report when it asserts that GLNPO has failed by not effectively coordinating the work of the other 12 federal agencies that are involved in restoration activities.

I would assert that GLNPO does a good job of coordinating work within EPA, across the three EPA regions that cover the Great Lakes, and with the states and tribes. However, their

authority to coordinate and direct the actions of other federal agencies is lacking and there is no overarching strategy that defines the various agency roles and responsibilities. So, to fault GLNPO for not coordinating activities in the Commerce Department, or Interior, or Agriculture is unrealistic and unfair.

Looking at just the thirteen federal agencies, imagine a small, leaky boat with thirteen fishermen, no captain, no map and an empty gas tank. Chances are this boat would get lost, fishing lines would get crossed, no one would want to row, and the boat might even sink while they debate whose in charge of bailing. We need a sturdy ship, a captain, a full tank of gas and a map to guide our journey.

Speaking of a full tank of gas, passage of the Great Lakes Legacy Act was the first major step in government action to clean up toxins that lurk in the muck on the bottom of our lakes. These toxins pose the single greatest threat to human health because they work their way up the food chain, accumulating all the way, ending up in the fish we all love to eat. Authorization is a good start, but full funding is even better.

To make full funding effective, we need to know where to start, where we are going and when we are done. That is, when is restoration complete? In this regard, EPA and Environment Canada should be commended for coordinating the SOLEC process that establishes some yardsticks by which the health of the Great Lakes can be measured. SOLEC started out with more than 850 indicators, cut them to 80, and we now have partial data to support 33 of the 80.

In our 11th Biennial Report, the IJC recommended doing the "top 3" first – fishability, swimmability and drinkability – and to do them right. These three are the top concerns of the public – fish that safe to eat, water that is safe to drink and beaches that are safe to swim on without fear of getting sick. However, despite the importance of getting this done right, SOLEC remains a voluntary process, is without a dedicated source of funding, and lacks a real quantitative basis for reaching conclusions about the health of the lakes.

With all the concerns that have been identified today, what do we do? What's our plan for the future? I believe the answer lies in the Great Lakes Water Quality Agreement. It's the fabric that binds together our two great nations, the single ecosystem we share and the goodwill of the people in both countries to restore the greatness to the Great Lakes.

The agreement has a great purpose – creating what I like to a call the three-legged stool that supports the basin ecosystem – restoring and maintaining the chemical, physical and biological integrity of the lakes. The agreement is a visionary and inspirational blueprint for international cooperation to restore the lakes. But, to achieve the goals of the agreement, our two sovereign nations have taken two separate paths, with dozens of agencies and hundreds of programs. What we need now is to breathe new life into the Agreement, to bring it into the 21st century, and to refocus international action on restoring the Great Lakes.

The times have changed, knowledge has changed, and the ecology has changed. Perhaps the time has come that we should reexamine the agreement to bring it into line with contemporary science and contemporary ecological challenges. For example, the specific

objectives for chemical integrity are out of date. The agreement is weak with respect biological challenges, especially with regard to invasive species. And there are virtually no provisions with respect to physical integrity, including critical issues like land use, dams, hydrological flows and climate change. About the only thing that has not changed is the Agreement itself.

The Great Lakes Water Quality Agreement is a living commitment to our shared waters. In fact, over the years, there have been substantial changes, but not since 1987. It's time to restore the balance across physical, chemical and biological integrity. It's time to address new challenges and to recognize new technologies and new ways of thinking. And it's time to complete the job with respect to monitoring and compliance.

For example, Article VI, section 1 (m) and Annex 11 of the agreement commit the U.S. and Canada to a coordinated monitoring and surveillance program to assess compliance, measure progress toward the specific objectives and identify emerging concerns. Prior to the 1987 amendments to the agreement, the IJC and our Great Lakes Water Quality Board were involved in managing and developing this program. However, as the GAO report notes, in 1987, this responsibility was shifted to the governments and subsequently languished.

As a result, the IJC – the independent watchdog – is dependent upon the very government programs that we evaluate for the data upon which to evaluate them. To make matters worse, since more than a dozen federal agencies are involved, there is no central repository of information. So we can't go to EPA for information about habitat loss; we have to get that from the Fish and Wildlife Service. For information on levels and flows, we have to go to the National Oceanic and Atmospheric Agency, the Army Corps of Engineers and others and so on. It's a virtually impossible task.

So, I would commend you, Mr. Chairman and Senators Levin, DeWine, Stabenow and Kerry for your cosponsorship of the Great Lakes Water Quality Indicators and Monitoring Act. In this regard, we would also especially commend the Great Lakes Environmental Research Laboratory in Ann Arbor for their innovative work developing the plans for a state-of-the-art monitoring and forecasting system. The implementation of this act will provide the data and the tools necessary to do our job in assessing the progress of both governments towards restoring the Great Lakes.

I also believe that a revised and updated Great Lakes Water Quality Agreement could form the basis for a major, binational Great Lakes initiative. There is growing momentum for such an initiative and many organizations and agencies already have plans that reflect the growing consensus that something significant must be done. We must be careful not to tear down, but rather to strengthen the institutional relationships and framework we have for the Great Lakes. We don't need to create new competing agencies, but rather to give the Great Lakes National Program Office the power, authority and budget they need to coordinate – and indeed, direct – the work across federal agencies and between Canada and the United States.

Permit me to be so bold as to suggest that this time the agreement should be submitted for Senate ratification to strengthen it and give it treaty status, making sure that promises made in writing become promises kept in action.

The Everglades and Chesapeake Bay restoration projects had overarching plans, a single point of accountability, effective monitoring, and the budget to execute the plan. As of today, the Great Lakes basin has none of these attributes. We cannot restore the greatness without the vision, the plan, the power and the budget. The Great Lakes deserve our greatest effort to make it happen.

Thank you.

2002

Report of the

Commissioner of the Environment and Sustainable Development

to the House of Commons

Chapter 4

Invasive Species

Office of the Auditor General of Canada

195

The 2002 Report of the Commissioner of the Environment and Sustainable Development comprises 6 chapters and The Commissioner's Perspective—2002. The main table of contents is found at the end of this publication.

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© Minister of Public Works and Government Services Canada 2002
Cat. No. FA1-2/2002-4E
ISBN 0-662-32874-4

Chapter

4

Invasive Species

The audit work reported in this chapter was conducted in accordance with the legislative mandate, policies, and practices of the Office of the Auditor General of Canada. These policies and practices embrace the standards recommended by the Canadian Institute of Chartered Accountants.

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Invasive Species

Main Points

4.1 The federal government has not responded effectively to invasive species that threaten Canada's ecosystems, habitats, and other species. Ten years after the federal commitment to prevent their introduction or to control or eradicate them, the number of invasive species in Canada continues to grow. We found that neither the United Nations Convention on Biological Diversity nor the Canadian Biodiversity Strategy has triggered an identifiable change in the government's approach:

- The federal government has not identified the invasive species that threaten Canada's ecosystems or the pathways by which they arrive.
- The human and financial resources to deal with invasive species are spread across several federal departments and agencies as well as outside organizations, and they are not co-ordinated. There is no consensus on priorities and no clear understanding among federal departments or between the federal government and other jurisdictions of who will do what to respond.
- The federal government has not established the capability to gauge progress on its commitment to deal with invasive species.

4.2 No federal department sees the big picture or has overarching authority to ensure that federal priorities are established and action is taken. There is a bias toward continuing dialogue and consensus building and a lack of practical action to prevent invasive species from harming Canada's ecosystems, habitats, or native species.

4.3 Since invasive species frequently travel along as stowaways with people, goods, and vehicles moving between regions with different ecosystems, increases in trade and the gross national product—clearly a key economic goal—will almost certainly lead to further invasions unless the federal government takes concrete steps to prevent them. If action is not taken, costs will mount; and because invasive species are a leading cause of biodiversity loss, our storehouse of biological resources will continue to be depleted.

4.4 Prevention is recognized by experts and the government as the best response to invasive species. Preventive measures would not be cost-free, or stop all invaders, but they are generally considered more practical than reacting to a succession of crises and repairing damage after invaders have become established. Prevention can also reduce the cost and ecological impacts of chemical controls and biodiversity loss associated with invasive species.

Background and other observations

4.5 Fish, plants, insects, bacteria, viruses, and other organisms found in an area beyond their native range are alien to that area. Not all alien species are harmful. Indeed, many have been introduced intentionally into Canada for the benefits they offered. But some, known as invasive species, can cause disease in native plants and animals or prey upon them; change local habitat, making it inhospitable to native species; or simply reproduce faster than native species and crowd them out by inhabiting their space and eating their food. Experts have concluded that invasive species are second only to habitat destruction as a leading cause of biodiversity loss, including local extinctions of species. Studies to date indicate that they cause billions of dollars of damage to Canada's economy every year.

4.6 In 1992, Canada and 167 other countries signed the United Nations Convention on Biological Diversity and pledged to prevent the introduction of, or control or eradicate, alien species that threaten ecosystems, habitats, or other species. The Biodiversity Convention Office was established at Environment Canada to co-ordinate a Canadian response; it produced the Canadian Biodiversity Strategy in 1995.

4.7 This audit focussed on the extent to which Environment Canada, on behalf of the federal government, has co-ordinated an effective national response to invasive species that threaten Canada's ecosystems, habitats, or other species. We set out to determine to what extent Canada's 1992 commitment and its 1995 strategy triggered a change in the federal government's approach to managing those species and the impact of any changes on prevailing trends.

The departments have responded. Environment Canada, Fisheries and Oceans Canada, and Transport Canada have accepted our recommendations. Their responses, which follow each recommendation in the chapter, indicate what the departments plan to do. The majority of their responses do not indicate when action will be taken; and in some cases the responses indicate that action is conditional on the availability of resources or on action by other departments or jurisdictions.

Introduction

The issue: Invasive species threaten ecosystems and the economy across Canada

4.8 Fish, plants, insects, bacteria, viruses, and other organisms found in an area beyond their native range are alien to that area. Not all alien species cause harm; in fact, many, including a variety of plant and animal species, have been introduced intentionally to provide economic benefits.

4.9 But some, including some that have been introduced intentionally, can cause disease in native plants and animals or prey upon them; change native habitat, making it inhospitable to native species; or simply reproduce faster than native plants and animals and crowd them out by inhabiting their space and eating their food. These are known as invasive species (see Appendix A for the definition of invasive species proposed by the Conference of the Parties to the United Nations Convention on Biological Diversity).

This shopping cart was left in zebra-mussel-infested waters for a few months. The mussels have colonized every available surface on the cart.

Photo: James F. Lubner, University of Wisconsin, Sea Grant Institute

4.10 Invasive species can also affect services that the native biology provides, such as soil retention, maintenance of water quality, and consumption of carbon dioxide by growing plants. And unlike most chemical pollutants that degrade over time, invasive species—which some scientists have termed biological pollution—have the potential to multiply, spread, and persist in the environment. Their impacts can ripple through the entire food chain.

A destructive force

4.11 Experts have concluded that invasive species are second only to habitat destruction as a leading cause of biodiversity loss. Their ecological effects are often irreversible and, once established, invasive species are extremely difficult and costly to control or eradicate. An invasive species with no natural checks on its survival or its spread can quickly obliterate native ecology, eliminating natural diversity in favour of a single dominant species. The zebra mussel is perhaps the most infamous invasive species in Canada (see page 4, "The zebra mussel is a well known invader").

4.12 In general, invasive species tolerate a broad range of conditions, reproduce quickly, disperse widely, and resist eradication. They have adverse effects on managed agriculture crops and forests as well as on natural ecosystems across Canada.

Regulated agriculture and forest pests can have serious ecological impacts

4.13 Canada has long-established laws and regulations to prohibit or restrict the entry of foreign animals or plants capable of causing economic damage to agricultural crops (including livestock) or forest trees.

4.14 The Canadian Food Inspection Agency (CFIA) has established procedures, and carries out a variety of activities, to reduce the risk of introduction into Canada of such regulated quarantine pests. The Agency also performs surveillance domestically to identify, control, or eradicate regulated pests that have gained entry to Canada.

4.15 In 1996 we audited the CFIA's programs for protecting agriculture crops and forest trees from regulated pests. We noted that in almost all cases, import permits were required for certain goods to control the movement of foreign animals or plants that could pose a threat to human health or the

The zebra mussel is a well known invader

The invasion of Lake St. Clair by the zebra mussel in 1988 annihilated 13 native species in that lake and caused the near extinction of 10 species in Western Lake Erie: one of the greatest reductions of biodiversity ever witnessed in North America.

In a 30-kilometre stretch of the Rideau River, just 25 kilometres south of Parliament Hill, the density of these creatures increased from one animal per square metre to 383,000 per square metre in just three years, wiping out all native mussel species in the process.

Zebra mussels are a major fouler of industrial, municipal, and hydroelectric water intakes and outfalls. They cause a decline in water flow and plant efficiency.

Ontario Power Generation estimates that as a direct consequence of zebra mussels, its operating costs increased by between $500,000 and $1 million per year at its Darlington and Pickering nuclear stations, and for fossil fuel stations, about $150,000 per year at Nanticoke, $75,000 per year at Lambton, and $50,000 per year at Lakeview. It has spent over $20 million installing and maintaining chlorine applicators at its Great Lakes facilities and a few inland facilities to deter zebra mussels, and it has spent $13 million on research to reduce or eliminate chlorine. Ongoing operating costs attributable to zebra mussels are not available for the hydraulic stations on the Great Lakes.

These costs and those confronting publicly owned water treatment facilities and other water-intensive industries could ultimately be passed on to homeowners and consumers.

Zebra mussels are also rapidly colonizing in Ontario's inland lakes. Once established there, they will clog water lines and foul piers, engines, and boats. They are also suspected of imparting offensive tastes and odours to drinking water. As many as 160,000 Ontario cottagers could ultimately pay significant costs to counteract problems caused by zebra mussels.

Finally, through their filtering activity, zebra mussels take in hazardous compounds such as polychlorinated biphenyls (PCBs). Fish and waterfowl that eat the mussels carry those poisons into the food chain. This invader has the potential to spread elsewhere in Canada.

economy. Usually, further diagnostic testing and health certification were required, and attestation by the government of the country of origin that the requirements set out in the import permit had been met. To provide additional assurances, imported goods were subject to possible inspection and quarantine upon arriving in Canada at land, sea, air, and mail ports of entry.

Did you know?

Number of alien agriculture and forest pests known to be in Canada: **94**

Number of invasive species that threaten Canada's ecosystems: **unknown**

4.16 We noted that the Canadian Food Inspection Agency had an internationally recognized risk assessment process and had allocated resources to complete scientific risk assessments of more than 350 specific commodities, diseases, and pests.

4.17 However, we also noted that the changing global economy had stepped up the pressures on the federal government to allow additional imports, increasing the risks to Canada. In the 1990s alone, imported cargo unloaded in Canadian ports increased by almost 40 percent. The number of countries exporting products to Canada also increased.

Once a tree in a row is infected, Dutch elm disease can move through connected root systems to kill the entire row.

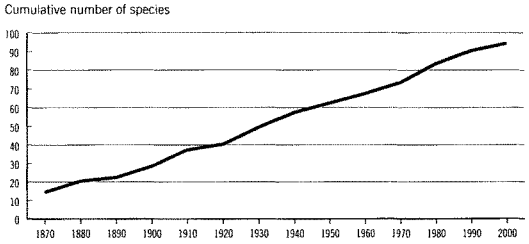
Photo: Dr. R. Jay Stipes, Virginia Polytechnic Institute and State University

4.18 While inspection rates are higher for regulated commodities and for shipments from certain countries of origin, on average Canada can manage to inspect only 1 percent to 2 percent of incoming shipments. Based on its inspections and on samples submitted to its labs for evaluation, the CFIA reported 1,074 interceptions of alien pests in 2000.

4.19 Despite continuing efforts to protect agriculture crops and forest trees, invasive pests gained access to Canada in the past, sometimes with devastating ecological impacts. Chestnut blight and Dutch elm disease are two examples. Dutch elm disease killed 600,000 elm trees in Quebec, and, in one year alone, killed 80 percent of Toronto's 35,000 elm trees.

4.20 Both invaders were so destructive that the American chestnut and the elm are no longer significant parts of the forest ecosystems of southeastern Canada. Dutch elm disease is still moving west in Canada, placing up to 700,000 trees at risk. Exhibit 4.1 shows the cumulative number of alien agricultural and forest pests known to have been introduced into Canada to date.

Exhibit 4.1 Alien agricultural and forest pests introduced in Canada (1870–2000)



Source: Based on data provided by the Canadian Food Inspection Agency

4.21 More recently, the Asian long-horned beetle and the brown spruce longhorn beetle from Europe have been discovered in Canada (see page 7, "Two alien beetles are clear and present dangers"). The former eats hardwood trees and the latter softwood trees; maple and spruce are favoured. Should current surveillance and control efforts fail, these two beetles have the potential to seriously harm forest ecosystems across Canada as well as the lumber, pulp and paper, maple syrup, nursery, commercial fruit, and tourism industries.

Invasive species jeopardize trade relationships

4.22 Invasive species can seriously damage or destroy native commercial species or make them unacceptable for export. Infection or infestation of commercially exported species can cause trading partners to impose restrictions on Canadian goods, with potentially enormous costs to the economy. Canada's heavy reliance on exports of natural resources and agricultural products makes it vulnerable to trade disputes and their consequences (see page 7, "Canada is vulnerable to trade disputes").

4.23 In its 1999 report, *Safeguarding American Plant Resources*, the National Plant Board of the United States expressed concern about Canada as a documented source of invasive species and recommended stronger restrictions on imports from Canada.

Many unregulated invaders also cause harm

4.24 In addition to the invasive species regulated as quarantine pests, there are many others that also threaten Canada's ecosystems, species, and habitats. While the total number of unregulated invaders is not known, examples include purple loosestrife, which threatens natural wetland ecosystems, especially in Quebec, Ontario, and Manitoba; European frog-bit, which clogs lakes and rivers in eastern Canada; and Scotch broom and gorse, which hinder the regeneration of commercial tree species such as the Douglas fir and have encroached on British Columbia's Garry oak ecosystems, where many species of plants and animals are at risk of extinction.

Aquatic invaders are a particular problem

Did you know?

Number of aquatic invaders thought to be in the Great Lakes: **160**

4.25 Unregulated invasive species also cause harm to Canada's aquatic ecosystems and impose tangible costs on many industries that depend on water, including fishing, power generation, and water treatment. Ship ballast water is widely recognized as the predominant source of unintentional introductions of aquatic invasive species (see page 8, "Ballast water is a major pathway for aquatic invaders").

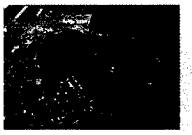
4.26 Scientists estimate that there are about 160 aquatic invasive species in the Great Lakes; there are more on Canada's east and west coasts. And the impacts are devastating. Green crab and codium are two examples of invasive species with the potential to cause harm on Canada's coasts (see page 9, "The green crab is eating its way up Canada's coasts").

Two alien beetles are clear and present dangers

In the summer of 2000, Point Pleasant Park in Halifax was infested with brown spruce longhorn beetles from Europe. By March 2002, more than 2,600 spruce trees in the park had been destroyed by authorities to control the bug, and another 1,600 outside the park boundaries. At present, the only control action thought to be effective is to quarantine infested or potentially infested areas and burn the trees.

Should quarantine and control efforts fail, the brown spruce longhorn beetle could spread throughout most of the softwood forests of Canada. Softwood is an extremely important and valuable source of lumber and pulp wood. In 1997 (the most recent year for which reliable data are available), sales of softwood lumber totalled more than $13 billion.

The Asian long-horned beetle has been intercepted by authorities in Vancouver and southern Ontario. While authorities believe that efforts to prevent that bug from becoming established in Canada have been successful, the Asian long-horned beetle poses a serious threat to Canada. The larvae of the Asian long-horned beetle tunnel under tree bark and bore into healthy hardwood trees, where they feed on living tissue and eventually kill the tree by disrupting the flow of water and nutrients. In Ontario and Quebec, more than 50 sawmills process hardwood, which is in high demand today for flooring, furniture, and cabinetry. Sales of hardwood totalled more than $480 million in 1997. The maple tree, which scientists have identified as the preferred diet of the Asian long-horned beetle, is a staple of the hardwood lumber industry. Maple syrup and sugar products were valued at more than $130 million annually in 1997.



Point Pleasant Park in Halifax with container port nearby.

Photo: Canadian Food Inspection Agency

Spruce trees killed by the brown spruce longhorn beetle in Point Pleasant Park, Nova Scotia.

Photo: Canadian Food Inspection Agency

Asian long-horned beetle larvae are wood borers and a serious threat to hardwoods such as Canadian maples.

Photo: Kenneth R. Law

Canada is vulnerable to trade disputes

On 31 October 2000, the U.S. Department of Agriculture imposed a prohibition on all imports of Prince Edward Island potatoes because of potato wart. Potato wart is primarily a soil-borne disease, and spores of the fungus can remain viable in contaminated soil for many years. Diseased potatoes are deformed and unmarketable.

Potato wart was eradicated from the United States in 1992 and according to the U.S. Department of Agriculture, if the disease were to reappear it could be devastating to the U.S. potato industry because of potential losses in production and export markets.

Until October 2000, potato wart in Canada occurred only in Newfoundland. On 24 October 2000, the Canadian Food Inspection Agency confirmed the presence of potato wart in a single field in Prince Edward Island.

The fungus that causes potato wart can lie dormant in soil for up to 40 years. In 2000, potato wart virus cost P.E.I. farmers millions in lost export sales.

Photo: Centro Internacional de la Papa

Though the U.S. ban on P.E.I. potatoes was lifted in April 2001, lost sales due to the U.S. ban were estimated at close to $30 million. Work hours of sorters, packers, and truckers were down 64 percent from the year before. The government of Prince Edward Island established a fund of up to $15 million to aid affected farmers.

The federal government responded by announcing up to $12.6 million to help farmers dispose of surplus potatoes that accumulated in the wake of the import restrictions. On top of the disposal funding, the federal government pledged emergency aid of $5.4 million to P.E.I. and an additional $1.5 million to help provide surplus potatoes to food banks across Canada. The Minister of Agriculture also noted that up to an additional $19 million in compensation would be provided through the Canadian Farm Income Program. Thus, total costs stemming from the six-month ban were as much as $83.5 million.

Although there may not be a causal link to events in P.E.I., in the first two months of the prohibition period potato exports to the U.S. fell 6 percent in New Brunswick, 22 percent in Ontario and 15 percent in Quebec.

Did you know?

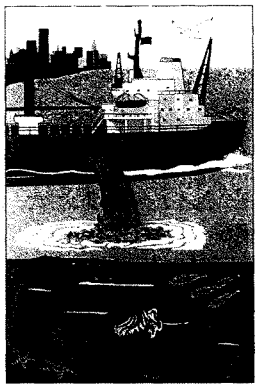
[illegible] cost to the Canadian economy is as [illegible] invasive species: billions of dollars yearly

The socio-economic costs of invasive species are already substantial

4.27 While there has never been a comprehensive assessment of the risks or the economic impacts of invasive species in Canada, several recent studies indicate that they impose a heavy hidden cost on society—as high as billions of dollars every year. For example, a recent study we obtained from officials of the Canadian Food Inspection Agency estimates that harmful invasive pests affecting agriculture crops and forest trees are costing today's economy $7.5 billion each year.

4.28 That estimate does not include the costs that stem from the impacts of regulated pests on natural ecosystems or the impacts of unregulated invasive species.

Ballast water is a major pathway for aquatic invaders

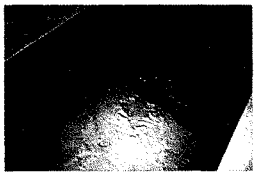


Ballast water is a common source of unintentional introductions of aquatic invasive species.

Ships take on ballast water for stability and safety. When they do, their ballast tanks also take on a wide variety of aquatic species, including micro-organisms, algae, plants, small fish, and invertebrates. Over time, a layer of sediment accumulates in the tanks and it can also contain alien species. A recent study estimated that 3,000 species of aquatic organisms are transported around the world every day in the ballast tanks of ships.

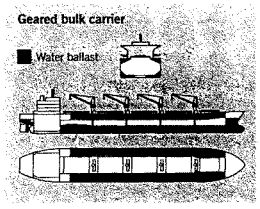
Ballast water can transport a range of micro-algae, including toxic species that may form harmful algae blooms or "red tides." The public health impacts of such outbreaks are well documented and include paralytic shellfish poisoning, which can cause severe illness and death in humans.

Scientific research has established that human pathogens are also transported in ship ballast water. A 1998 study that sampled the ballast water of 28 transoceanic vessels en route to the Great Lakes found a number of known human pathogens (including salmonella, Vibrio cholerae, Giardia, and fecal coliforms such as E. coli) in one or more of the samples.



Ballast tank sediment contains alien species that may be released into Canadian ports as foreign vessels pick up and off-load cargo.

Photo: Phil Jenkins



Typical location of ballast tanks on a commercial ship.

Source: Phil Jenkins

Ships pump out their ballast tanks in ports when they pick up cargo. In 1999, there were 201 Canadian ports reported to have handled cargo, 57 percent of it at 10 of the ports.

The introduction of invasive species through ballast water is an unintended consequence of a measure that serves a vital purpose to shipping and ship safety. However, while the *Canada Shipping Act* allows the federal government to regulate ballast water to prevent introductions of aquatic invasive species, it has not done so; nor has it assessed the potential risks that ballast water may pose to public health.

4.29 Moreover, current estimates of the economic costs created by invasive species tend to be limited to specific pests, regions, or industries. For example, a recent estimate of damage caused by leafy spurge—an invasive plant that contains poisonous latex, which can cause contact dermatitis in humans and

The green crab is eating its way up Canada's coasts

The green crab, otherwise known as the cockroach of the sea, invaded the coast of North America at Cape Cod more than a century ago. By the 1950s, it had colonized in the waters of New Brunswick. It is likely that it invaded British Columbia in 1998 through warm tidal currents due to El Niño. The green crab not only preys on native crabs, clams, oysters, and mussels and occupies their habitat but also eats the same food as crabs, lobster, and many seabirds. A single green crab can eat 40 clams in a day. It also carries a parasite that is harmful to the eider duck, whose downy feathers have been prized for generations as insulation and bedding material.

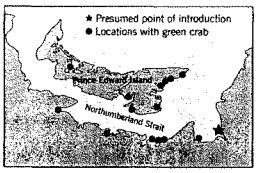
The demise of the softshell clam fishery in northern New England and Nova Scotia in the mid-1950s was associated with green crab. In California the green crab was also blamed for losses of Manila clams as high as 50 percent.

The green crab is aggressively colonizing along Canada's east coast, putting Canada's clam, mussel, and oyster industries at risk. The landed value of Atlantic clams, mussels, and oysters was about $57 million in 2000. The landed value of Atlantic lobster, which scientists believe may also be threatened, was over $500 million in 2000.

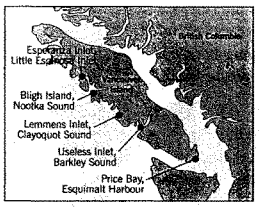
On the west coast, the Strait of Georgia is believed to be suitable habitat for green crab. The landed value of native clams and crab in British Columbia was approximately $25 million in 2000. Dungeness crab is the most important commercial crab species in British Columbia. Roughly 222 fishing vessels and their crews rely on it and thousands of crab fishermen from 33 coastal First Nations communities depend on it. Recreational crabbers are estimated at between 10,000 and 20,000.

This omnivorous, aggressive and opportunistic intruder has left native populations of shellfish decimated in its wake.

Photo: Glen Jamieson, Fisheries and Oceans Canada



Source : Dr. Andrea Locke, Fisheries and Oceans Canada



Distribution of the European green crab on Canada's east and west coasts.

Source: Fisheries and Oceans Canada

The undersea plant codium is a threat

Codium is an invasive form of algae that can cause major devastation to local habitat, affecting native species of kelp, eelgrass, sea urchin, oysters, and lobster.

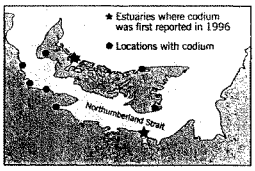
Photo: John Pearse, University of California, Santa Cruz

Scientists believe that codium smothers native mollusks, interferes with the reproductive cycle of the sea urchin, and drives out eelgrass that is habitat for eel. It also crowds out native kelp, which is prime habitat for lobster and other commercially valued species.

In Canada, codium is found along the coast of British Columbia, including the Queen Charlotte Islands and Vancouver Island. It was first reported on the east coast in Nova Scotia, in the late 1980s, and has since been discovered in the coastal waters of Prince Edward Island.

Codium is thought to have significant impacts on the lobster, oyster, kelp, and sea urchin industries and it may also affect eel.

In 2000 the value of the Atlantic sea urchin industry was more than $7 million. Eel catches brought in about $700,000.



Distribution of codium in the southern Gulf of St. Lawrence.

Source: Dr. Andrea Locke, Fisheries and Oceans Canada

can kill cattle if eaten in quantity—put the total cost of control in Saskatchewan at $7 million a year.

4.30 A study of the spread of Dutch elm disease in Manitoba estimated the total cost of research, suppression, and tree replacement at $1.5 million a year. That study also concluded that the rate of elm tree loss in Winnipeg had increased from 2.5 percent in 1975 to 5 percent in 1996, despite all mitigation measures. The value of the 700,000 elm trees left in Canada is estimated at more than $2.5 billion. Some of the costs associated with specific aquatic invaders are presented in the cases already cited.

Did you know?

Number of elm trees at risk from Dutch elm disease in Canada: **700,000**

Number of trees already killed in Quebec: **600,000**

4.31 Most estimates of economic impact are restricted to losses of output and/or costs of control. Most do not reflect the social costs that invasive species can entail, such as lowered property values or falling tourism and employment. Many Canadians own or work in industries whose prosperity depends on a healthy ecology.

4.32 Thus, current estimates of the economic harm caused by invasive species, though large, likely underestimate the total actual costs.

The problem is large and getting worse

4.33 Despite the government's long-standing commitment to deal with the problem of invasive species, their numbers have grown steadily for decades. If trends continue, costs will mount. Moreover, because invasive species are a leading cause of biodiversity loss, our storehouse of biological resources will continue to be depleted.

The federal role

4.34 **A goal to prevent, control, or eradicate invasive species.** Canada has legislation and programs dealing with invasive species that are capable of causing economic damage to agriculture crops or forest trees or that pose a threat to animal or human health. However, those laws and programs were not intended to protect Canada's biodiversity.

Did you know?

Number of nations that signed the United Nations Convention on Biological Diversity pledging to deal with alien species that threaten ecosystems, habitats, or other species: **167**

4.35 In 1991, the Biodiversity Convention Office was established at Environment Canada to co-ordinate Canada's response to the upcoming United Nations Convention on Biological Diversity. Canada and 167 other countries signed the Convention in 1992. Among other things, the federal government committed to prevent the introduction of or to control or eradicate alien species that threaten ecosystems, habitats, and other species.

4.36 In 1995, the Biodiversity Convention Office produced the Canadian Biodiversity Strategy, which pledged the federal government to take all necessary steps to prevent the introduction of harmful alien organisms and to eliminate those already present or reduce their adverse effects to acceptable levels. The strategy presented actions for accomplishing that objective, set out as follows:

- Develop and implement effective means to identify and monitor alien organisms.

- Develop national and international databases that support the identification and anticipation of the introduction of potentially harmful alien organisms in order to develop control and prevention measures.
- Determine priorities for allocating resources to the control of harmful alien organisms based on their impact on native biodiversity and economic resources, and implementing effective control or, where possible, eradication measures.
- Identify and eliminate common sources of unintentional introductions.
- Ensure that there is adequate legislation and enforcement to control introductions or escapes of harmful alien organisms.
- Improve preventive mechanisms such as screening standards and risk assessment procedures.

4.37 Along with Environment Canada, the lead department for the Canadian Biodiversity Strategy, two other federal departments play key roles in managing the problem of aquatic invaders. Transport Canada is responsible for regulating and controlling the management of ballast water on ships and preventing or reducing the release of foreign aquatic organisms or pathogens by ships entering Canadian waters. Fisheries and Oceans Canada is responsible for conserving and protecting fish, including their habitat and food. More specifically, it has responsibility for performing scientific research and providing scientific advice in connection with ballast water regulations and standards.

Focus of the audit

4.38 We focussed on whether Environment Canada, as the lead federal department, has successfully co-ordinated the implementation of a coherent and comprehensive national program to protect Canada's ecosystems, habitats, and species from existing and potential invaders. We set out to determine whether Canada's 1992 commitment and its 1995 strategy had triggered a change in the federal government's approach to managing invasive species that threaten Canada's ecosystems, habitats, and other species and to determine the impact of any such change on prevailing trends.

4.39 **We looked to existing action plans for benchmarks.** In addition to the United Nations Convention on Biological Diversity and the Canadian Biodiversity Strategy, we examined the United States Management Plan. We also reviewed the Global Strategy on Invasive Alien Species, produced in 2001 by the Global Invasive Species Program. That program was established in collaboration with many international environmental organizations, including the World Conservation Union with initial support from the United Nations Environment Program.

4.40 The plans and strategies we reviewed propose in common a number of criteria for an effective response to invasive alien species, including

- risk assessment, to understand what species and pathways pose the greatest threats and need to be managed under the plan;
- leadership and co-ordination, to understand who will take what actions to respond to key risks; and

- monitoring, to understand whether prevention and control measures are working or whether corrective action is required.

The plans consistently refer to prevention as the principal objective.

4.41 **Thus, we focussed on three key criteria.** In our view, to assure Canadians that it is responding effectively to the problem of invasive species that threaten Canada's environment, the federal government needs to know

- what invaders pose the greatest risks to Canadian ecosystems, habitats, or species and by what major pathways they arrive;
- who is taking what action to respond to major risks; and
- how effective those actions have been at eliminating or reducing adverse effects to acceptable levels so the government can determine whether programs are working or whether corrective measures are required.

We looked at whether Environment Canada has that information or has established the basic tools it needs to acquire it.

4.42 Since ship ballast water is the most important source of unintentional introductions of aquatic invasive species, we examined how the federal government is managing those species and that path of entry.

4.43 We looked at whether Transport Canada has ensured that regulations and enforcement are adequate to control the introduction of alien species into Canadian waters from ship ballast.

4.44 And we looked at how Fisheries and Oceans Canada has responded to the goal and strategies set out in the Canadian Biodiversity Strategy. Specifically, we set out to determine whether the Department has identified the alien aquatic species that pose the greatest risks to Canada, determined priorities for action based on risk, and put in place the monitoring tools it would need to know whether measures taken to prevent the introduction of those species into Canadian waters have been effective. We did not look at the Department's programs dealing with introductions of alien or genetically modified species from domestic fish stocking programs or from aquaculture operations.

4.45 The United States General Accounting Office performed an audit dealing with invasive species in parallel with our own. Part of its report also discusses ballast water and regulation and enforcement by U.S. authorities (the report will be available at GAO-03-01 at www.gao.gov/cgibin/getrpt?gao-03-01).

4.46 In addition, in its 11th Biennial Report on the Great Lakes Water Quality Agreement, the International Joint Commission (IJC) raises concerns about the introduction of aquatic invaders into the Great Lakes from ship ballast water and sediment in ship ballast tanks (see www.ijc.org).

4.47 A description of the audit performed by the U.S. General Accounting Office and the conclusions of the IJC report are provided in appendices B and C.

Observations and Recommendations

A gap between commitment and corrective action

4.48 The federal government has a range of legislation and programs to safeguard agriculture crops (including livestock), forest trees, and human health from specific types of alien pests. But it has mobilized no similar level of effort to fulfil its pledge to protect Canada's ecosystems, habitats, and species from other invaders.

Canada has yet to identify the greatest threats

4.49 Environment Canada has not co-ordinated the federal efforts to identify present and potential invaders that threaten Canadian ecosystems and their key pathways of arrival into Canada. It has not organized a comprehensive assessment of the risks that invasive species pose to our environment and economy. Thus, the federal government has no means to determine the greatest threats to Canada's ecosystems from invasive species; to set national priorities for prevention, control, or eradication; and to allocate its scarce resources to areas of greatest risk.

4.50 And Environment Canada lacks the information it would need on ecological and socio-economic impacts to make a strong business case for obtaining additional funds to deal with invasive species that threaten Canada's ecosystems.

No agreement on what needs to be done and by whom

4.51 The past decade has seen an overwhelming volume of information generated on invasive species. They have been the subject of conventions, resolutions, agreements, strategies, action plans, guidelines, studies, and codes of conduct and practice; Exhibit 4.2 lists some related to aquatic invasive species. Together, exhibits 4.1 and 4.2 show that despite decades of planning and deliberations, the number of invaders in Canada continues to grow.

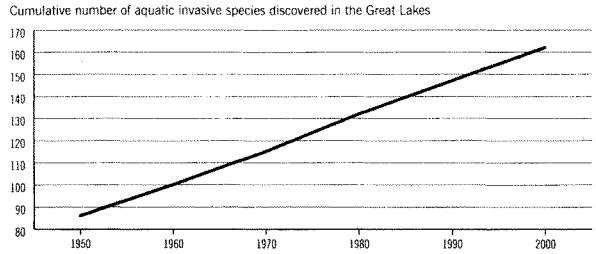
4.52 There is still no clear understanding among federal departments or between the federal government and other jurisdictions about who will do what to respond to invasive species that threaten Canada's ecosystems.

No capability to gauge progress

4.53 There is no formal mechanism that federal departments or others can use to share information with Environment Canada on invasive species or on the effectiveness of measures taken to counteract them.

4.54 Thus, Environment Canada has no basis to know who is taking what measures or to report on how effective any measures have been. The federal government cannot demonstrate that it has prevented the entry of invasive species that threaten Canada's ecosystems or even slowed their rate of entry. Prevailing trends indicate that not enough is being done.

Exhibit 4.2 **Despite decades of agreements and accords, the number of invaders in the Great Lakes continues to grow**



1955	■ Great Lakes Fishery Commission and its Sea Lamprey Control Program established by the Convention on Great Lakes Fisheries Between Canada and the United States of America
1981	■ Great Lakes Fishery Commission's Joint Strategic Plan for Management of Great Lakes Fisheries
1987	■ Great Lakes Water Quality Agreement amended to include research on non-native species and ballast water discharge
	■ World Conservation Union Position Statement on Translocation of Living Organisms
1989	■ Voluntary Guidelines for the Control of Ballast Water Discharges from Ships Proceeding to the St. Lawrence River and the Great Lakes
1992	■ United Nations Convention on Biological Diversity
1993	■ International Maritime Organization Resolution A.774(18) Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges
1994	■ The 1994 version of the Canada–Ontario Agreement Respecting the Great Lakes Basin Ecosystem—references to invasive species
1995	■ Canadian Biodiversity Strategy
	■ World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures
	■ United Nations Food and Agricultural Organization Code of Conduct for Responsible Fisheries
1997	■ International Maritime Organization Resolution A.868(20) Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Aquatic Organisms and Pathogens
1998	■ Bill C–15 to amend the *Canada Shipping Act*, to allow for regulations relating to ballast water
1999	■ Resolution VII.14 on Invasive Species and Wetlands under the United Nations Convention on Wetlands of International Importance
2000	■ The Shipping Federation of Canada's Code of Best Practices for Ballast Water Management
	■ Voluntary Guidelines for the Control of Ballast Water Discharge from Ships in Waters Under Canadian Jurisdiction (update to the 1989 Voluntary Guidelines)
	■ Great Lakes Commission's Great Lakes Action Plan aimed at the prevention and control of aquatic invasive species
	■ Global Ballast Water Management Programme
	■ Interim Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species under the Convention on Biological Diversity
	■ World Conservation Union Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species
2001	■ Global Invasive Species Programme's Global Strategy on Invasive Alien Species
	■ Great Lakes Commission's Policy Statement on Ballast Water Management
2002	■ Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species, under the Conservation on Biological Diversity

■ Canadian initiatives ■ Canada–U.S. initiatives ■ Multilateral initiatives

4.55 As the department with lead responsibility for co-ordinating the federal government's response to invasive species, Environment Canada needs to be in a position to lead the initiative and report Canada's progress on its commitment to prevent the introduction of or to control or eradicate invasive species.

4.56 **Recommendation.** Environment Canada should put in place a national invasive species action plan to clearly identify the invasive species that pose the greatest risks to Canada's ecosystems, habitats, and species and the main pathways by which they arrive in Canada; to set out priorities for action based on risk assessment; and to lay out results expectations, roles, responsibilities, and resource requirements.

Environment Canada's response. Agreed. Environment Canada recognizes the significant threat that invasive alien species pose to Canada's biodiversity, economy, and society.

Environment Canada is co-ordinating the development of a national plan to address the threat of invasive alien species on behalf of the Wildlife Ministers Council of Canada, the Canadian Council of Forest Ministers, and the Canadian Council of Fisheries and Aquaculture Ministers. The results of a multi-stakeholder national workshop on invasive alien species, held in November 2001, have formed the basis of a draft plan that was presented to a joint meeting of these councils in September 2002 and will now be further elaborated for approval of these councils in fall 2003. The plan will outline processes for the identification and assessment of invasive species and pathways of invasion, priorities for action based on risk assessment, and measures to be taken to address these priorities (including identifying results expectations, roles, responsibilities, and resource requirements). Implementation of the plan will be an ongoing challenge over the long term, both within Canada and internationally, and will require a significant investment of resources.

4.57 **Recommendation.** Environment Canada should put in place a monitoring and reporting system to track the effectiveness of measures taken relative to the results expectations set forth in the plan and report progress annually.

Environment Canada's response. The plan will provide for a monitoring and reporting system that would be developed in partnership with all federal departments with responsibilities related to invasive species as well as with the provinces and territories, to track the effectiveness of measures taken relative to the results expectations set forth in the plan and to report progress on a regular basis.

Transport Canada is not regulating or monitoring ballast water discharges

4.58 Transport Canada is responsible for regulating ballast water and preventing the introduction of aquatic invasive species by ships. We therefore expected it to ensure that regulation, monitoring, and enforcement of ballast water discharges in Canadian waters are adequate. We also expected that it

would maintain records of its monitoring and enforcement activities and report on its performance.

4.59 We found that Transport Canada does not regulate ballast water discharges; nor does it monitor or report on compliance with existing guidelines on ballast water exchange. The United States regulates ballast water discharges in the Great Lakes, and Canada relies exclusively on U.S. inspection and enforcement in that region.

4.60 However, there is no official arrangement between Transport Canada and the U.S. authorities to co-operate on inspection or enforcement or to exchange information. While the U.S. provides compliance data to the International Joint Commission every two years, Transport Canada keeps no records on compliance levels.

4.61 Ironically, the United States ballast water exchange regulation is based on a Canadian voluntary guideline established in 1989 to protect the Great Lakes. The assumption behind the guideline is that salt water from the deep ocean will either flush out or kill potential invaders picked up in foreign ports before they reach the Great Lakes ports. This theory has never been proved. Moreover, neither Canada's voluntary guideline nor the U.S. regulation for the Great Lakes applies to ships that declare no ballast on board (NOBOBs). Between 75 percent and 95 percent of ships entering the Great Lakes are so-called NOBOBs. The ballast tanks of those ships contain sediment that can harbour invasive alien species. Many experts are sceptical about the effectiveness of ballast water exchange as a solution to the problem of invasive species, given that the rate at which new aquatic invasive species are colonizing in the Great Lakes has not declined since 1989.

4.62 Nevertheless, Transport Canada told us that it intends to fulfil the commitment in its sustainable development strategy to regulate ballast water exchange by making its guideline mandatory for the Great Lakes by late 2002.

4.63 Unless the planned regulation goes beyond the existing voluntary guideline to establish requirements for NOBOBs and testing for the presence of living organisms in ballast water and ballast tank sediment against clearly defined criteria, it will likely be insufficient to protect the Great Lakes. And since the government does not intend to apply the new regulations on Canada's coasts, there will continue to be no federal requirement for ballast water management in those regions and gaps will remain in the federal government's ability to control introductions of invasive species from ship ballast.

4.64 **Recommendation.** Transport Canada should formalize arrangements with U.S. authorities for sharing current information on compliance with U.S. ballast water regulations and for co-ordinating efforts to regulate, monitor, and enforce any future Canadian ballast water regulations.

Transport Canada's response. Transport Canada shares information with the United States Coast Guard under the aegis of the Great Lakes Water Quality Agreement. Specifically, since 1993 the U.S. Coast Guard has inspected all ships entering the Great Lakes, enforcing U.S. laws. It provides the

compliance data for the binational report to the International Joint Commission, which is prepared by Transport Canada, the Canadian Coast Guard, and the U.S. Coast Guard.

Transport Canada, specifically Headquarters and the Ontario Region, participates with the U.S. Coast Guard in Cleveland on the Working Group under the Great Lakes Waterways Management Forum with respect to information sharing.

4.65 **Recommendation.** Transport Canada should develop and implement a means to monitor, maintain records, and report on compliance with any future Canadian ballast water regulations.

Transport Canada's response. The current guidelines require all vessels to complete a ballast water report and submit it to the Canadian Coast Guard (ECAREG/WESTREG) for transmission to the respective Transport Canada regional office. The east coast office maintains a database on compliance. Non-compliant vessels are boarded by Transport Canada Marine Safety Inspectors and inspected at the port of call. The U.S. Coast Guard inspects all vessels at Massena, New York, before they enter the Great Lakes, in accordance with its regulations under U.S. law. Any vessel found non-compliant is not allowed to proceed.

The reporting requirement will become mandatory under the Ballast Water Regulations that are to be included under the *Canada Shipping Act*. In this context, records will be maintained and compliance will be reported through the existing formalized processes.

Fisheries and Oceans Canada has not responded systematically to aquatic invaders

4.66 Aquatic invasive species threaten many native species of Canadian fish as well as their habitat and their food supply. Because Fisheries and Oceans Canada is responsible for protecting fish and their habitat and food, we expected that it would have identified the aquatic invaders threatening Canada, assessed the relative risks, and on the basis of those risks determined the priorities for prevention, control, and eradication. We expected that it would also have established a tracking system to monitor the effectiveness of any measures taken so it could carry out corrective action as necessary.

4.67 In our 2001 audit report on the Great Lakes and St. Lawrence River basin, we made several observations on the management of aquatic invasive species in the Great Lakes and the role of Fisheries and Oceans Canada. We reported that the Department needed to define its roles and responsibilities for conserving and protecting the fisheries, provide better protection against harmful invasive species, and protect and manage fish habitat more effectively (2001 Report of the Commissioner of the Environment and Sustainable Development, www.oag-bvg.gc.ca).

4.68 In the current audit, we found that Fisheries and Oceans Canada has not established a co-ordinated national response to aquatic invasive species. The Department has not catalogued the aquatic invasive species threatening Canada's freshwater and marine environments or the main pathways by

which those species arrive. It has not assessed the relative risks of invasive species as a basis to establish priorities for their prevention, control, and eradication. Nor has it put in place the monitoring tools to measure and report on the effectiveness of any measures taken.

4.69 Fisheries and Oceans Canada needs to establish the capability to demonstrate on a national basis the extent to which it has been successful in protecting Canadian fish, including their habitat and food, from aquatic invasive species.

4.70 **Recommendation.** Fisheries and Oceans Canada should develop and implement a means to identify and assess the risks of aquatic invasive species and use it as tool for setting departmental priorities and objectives for the prevention, control, or eradication of those risks.

Fisheries and Oceans Canada's response. Agreed. As identified in paragraph 4.56 of the chapter, Environment Canada has initiated the co-ordination of a national action plan to address invasive species in Canada. Fisheries and Oceans Canada will take the lead role with respect to the portion of the national action plan that deals with aquatic invasive species. Fisheries and Oceans will work collaboratively with other federal departments, provincial governments and stakeholders to develop a plan to address aquatic species issues in Canada, including funding for the plan.

In the context of the national action plan, Fisheries and Oceans Canada will use an integrated risk analysis framework to assist in identifying the risks to aquatic ecosystems and their resources that are posed by aquatic invasive species relative to the risks posed by other stressors. Results of the risk analysis will then be used to help set science priorities.

[Fisheries and Oceans provided an expected completion date of Fall 2003.]

4.71 **Recommendation.** Fisheries and Oceans Canada should put in place a monitoring and reporting system to track the effectiveness of measures taken toward its invasive species objectives and should report its progress annually.

Fisheries and Oceans Canada's response. Agreed. Fisheries and Oceans Canada will assess the relative risk of aquatic invasive species using a risk analysis framework. It will also assess its current scientific and financial capacity to address the high-priority risks identified. The implementation of a monitoring and reporting system to track the effectiveness of any future actions will be evaluated following the completion of the risk analysis and reporting requirements that may emerge from the national action plan to address invasive species.

Recent planning activities may not lead to real progress

4.72 Environment Canada began in late 2001 to co-ordinate the development of a draft national plan to address invasive species in Canada. According to Environment Canada, that document is being elaborated for approval by late 2003. However, the 1995 Biodiversity Strategy already contains a clear goal of prevention as well as many of the key actions required to accomplish it.

4.73 To build on the strategy, the new plan will need to clearly identify the government's priorities for prevention and the roles, responsibilities, resources, and results expected of each federal department and other participating organizations.

4.74 However, officials of the Department noted that while Environment Canada may be co-ordinating the federal government's plan for responding to invasive species, it does not have overarching responsibility for ensuring that the plan is implemented. Thus, the new plan's success will require the commitment of each organization to act.

4.75 **Recommendation.** Environment Canada should secure the commitment of each relevant federal department to act on its contribution to implementing the plan.

Environment Canada's response. Environment Canada is working with the Canadian Food Inspection Agency, Fisheries and Oceans Canada, Transport Canada, other federal departments, other jurisdictions, and relevant experts to develop the plan. Participating departments and jurisdictions will be encouraged to contribute to implementation of the national plan according to the priorities set out in the plan and the resources that they have available.

Real progress on controlling aquatic invaders in particular could be a long way off

4.76 The example of aquatic invaders suggests that getting the necessary commitment may prove difficult. Though responsible for regulating and controlling the management of ballast water on ships and preventing or reducing the release of foreign aquatic organisms or pathogens, Transport Canada told us that it is relying on Fisheries and Oceans Canada to identify criteria that could form the basis of an effective ballast water regulation.

4.77 Fisheries and Oceans Canada told us that it is not responsible for developing science-based criteria that could form the basis of a ballast water regulation, although ballast water is the predominant source of aquatic invaders. Nor will it be taking any regulatory action, since regulating ballast water is now Transport Canada's responsibility. Yet in its 2001 sustainable development strategy, Fisheries and Oceans Canada recognized that the "unintended introduction into Canada's marine and freshwater systems of exotic plant and animal species via vessel ballast water discharges is increasingly a concern, which demands further action by [this department] and its provincial counterparts." It goes on to say "there is a growing need... to work with other departments to better understand the nature of ballast discharge and the consequences of these introductions and to take regulatory action."

4.78 Both Transport Canada and Fisheries and Oceans Canada recognize that ballast water and sediment are major pathways for invading organisms, and both departments have participated in national and international discussions on the ballast water issue for more than a decade. Yet neither has developed or proposed a ballast water quality standard or criteria for testing ballast water for the presence of alien organisms to ensure that the risk of

unintentional introductions of alien species is eliminated or reduced to acceptable levels.

4.79 According to officials at Transport Canada, at the current rate of progress it could be another 10 to 15 years before an internationally acceptable standard for ballast water quality is in place, and possibly another 20 years before ships worldwide could be retrofitted with the necessary technology or be replaced. Thus, 30 years or more may go by before unintentional introductions from ballast water discharges are eliminated or reduced to acceptable levels in response to the government's 1995 commitment.

4.80 Transport Canada needs to ensure that the ballast water of ships is managed according to best management practices. Best management practices can include processes and procedures aimed at meeting specified quality criteria or ensuring compliance with regulatory standards; records required to provide objective evidence of activities performed or results achieved; training to ensure competency; and requirements for reporting. The Department also needs to set a timetable for establishing a standard for ballast water discharge quality and regulating ship ballast water so the risk of introductions of alien aquatic species into Canadian waters from that source is eliminated or reduced to an acceptable level.

4.81 Recommendation. Transport Canada should define best management practices for ship ballast and establish regulations requiring application of those practices on all ships entering Canadian waters.

Transport Canada's response. Regulations will be based on best management practices. The most appropriate approach is to continue to work through the International Maritime Organization (IMO) on establishing internationally recognized and accepted ballast water management practices. The IMO requirements do not apply to the Great Lakes and St. Lawrence River systems. The proposed regulations for that area will be compatible with the existing U.S. regulations for the Great Lakes and should be implemented before IMO completes its work. For the east and west coasts, the Regulations will be further refined to be consistent with the direction of the IMO.

Transport Canada intends to include sound scientific rationale in these regulations. Transport Canada believes that it is not sufficient to rely on a given salinity as proof that ballast water exchange has been completed, nor has it necessarily been effective.

Sampling protocols will be established with advice from Fisheries and Oceans Canada, and provisions for allowing sampling will be incorporated into the regulations.

4.82 Recommendation. Fisheries and Oceans Canada should define criteria for ballast water discharge quality that would eliminate the risk of introductions of aquatic invasive species from ship ballast water, including sediment, or reduce it to acceptable levels; and provide those criteria to Transport Canada in support of that Department's regulatory development, inspection, and enforcement efforts.

Fisheries and Oceans Canada's response. Agreed. As per ministerial agreement, Fisheries and Oceans Canada will continue to work with Transport Canada to develop science-based advice for ballast water discharge quality and evaluate the effectiveness of current ballast water guidelines. Fisheries and Oceans Canada will also continue to support Transport Canada's efforts directed at the international regulation of ballast water exchange and treatment through its participation on the Marine Environmental Protection Committee of the International Maritime Organization.

4.83 **Recommendation.** Transport Canada should establish a timetable for obtaining the scientific advice it needs from Fisheries and Oceans Canada and for establishing a quality standard for ballast water discharges that will eliminate the risk of introductions from ship ballast or reduce it to acceptable levels.

Transport Canada's response. The provision of scientific advice to Transport Canada by Fisheries and Oceans Canada is contained in an existing memorandum of understanding. Fisheries and Oceans Canada will address the scope and implications of advice required as part of their implementation plan.

Fisheries and Oceans Canada and Transport Canada participate in U.S. Coast Guard initiatives related to the establishment of technical standards for onboard ballast water treatment. Both departments also participate on the Marine Environmental Protection Committee of the International Maritime Organization with respect to international regulation of ballast water exchange as an interim step, and ballast water treatment in the longer term.

4.84 We note that in its most recent biennial report, the International Joint Commission recommended the development and use of standards for treatment of ballast water to eliminate introductions of organisms from ballast water and ballast tank sediment or reduce them to an acceptable level (see Appendix C and www.ijc.org).

Someone needs to take charge

4.85 The invasive species problem is frequently described as both a national and an international problem, characterized by shared jurisdictions and responsibilities and by a broad, complex range of other concerns. Indeed, our discussions with federal officials frequently turned to those complexities and constraints.

4.86 However, within the federal government the authority and the human and financial resources to deal with invasive species are spread across several federal departments and agencies, and are not co-ordinated. Environment Canada does not have the big picture. It has yet to identify the greatest threats to Canadian ecosystems, secure agreement on what will be done by whom, or establish the capability to gauge progress. There is no national action plan to guide progress, and each organization is focussed independently on its own priorities.

4.87 Ten years after the federal government committed to their prevention, control, or eradication, invasive species continue to be introduced into Canada. The scientific literature and the government's own documents point out that the number of alien species entering Canada continues to increase, demonstrating that the level of effort to prevent introductions has not been adequate.

Close the door to invasive species

4.88 Government policy is consistent with expert opinion that the preferred response to invasive species is to prevent them from entering the country and becoming established. The federal government committed to prevention more than 10 years ago.

4.89 While preventive measures would not be cost-free or catch all potential invaders before they became established, prevention is generally considered less costly than controlling pests and repairing damage caused by invaders that have taken hold. Prevention can minimize the cost and ecological impacts of chemical control and biodiversity loss associated with invasive species.

4.90 To prevent the introduction of new invasive species, authorities need to go beyond planning and take action, including the actions set forth in the Canadian Biodiversity Strategy.

A "wait and see" approach is not the answer

4.91 It is critical to detect potential invaders that enter Canada and to respond rapidly before they become established. The case of the sea lamprey helps to illustrate why.

Sea lamprey on lake trout. Sea lamprey mouth (inset).

Photo: Great Lakes Fishery Commission

4.92 In reaction to the sea lamprey—which attacks all species of large Great Lakes fish including lake trout, salmon, rainbow trout, whitefish, walleye, and catfish—Canada and the United States created the Great Lakes Fishery Commission. Sea lamprey research and control efforts have continued for more than 40 years.

4.93 Today, the primary means of controlling the sea lamprey is to use a chemical discovered in 1958 called TFM. In 2001, 28 tonnes of TFM were put into streams flowing into the Great Lakes. Chemical controls including herbicides and insecticides are used across Canada to combat both native and invasive pests. While chemical controls have proved effective in reducing the immediate economic damage that pests can cause, their long-term implications for the environment and human health are uncertain.

Did you know?

Number of tonnes of pesticide used to control sea lamprey in the Great Lakes in 2001: **28**

4.94 In our 2001 audit report on the Great Lakes and St. Lawrence River basin, we noted that while the effects of TFM are thought to disappear in three to five days, further research is needed to determine whether current levels can cause endocrine disruption or reproductive impairment in the basin's fish.

4.95 The financial cost of controlling sea lamprey in 2002 (not including the cost of running the Great Lakes Fishery Commission offices) was US$14.4 million; Canada's contribution was US$3.9 million.

4.96 Given the impacts of invaders once they become established—the ecological and economic damage they cause, the financial cost of keeping them in check, and the possible implications of controlling them chemically—it is clear why keeping them out is the best strategy.

Canada needs to practice its environmental principles

4.97 Federal environmental policy has advocated the precautionary principle for years: Where there are threats of serious or irreversible damage, lack of scientific certainty is not to be used as a reason for postponing measures to prevent environmental degradation.

4.98 Scientists believe that the ecological damage caused by invasive species is both serious and irreversible. Yet, after a decade of deliberations and resolutions, the federal government has not taken effective precautions to prevent introductions of species that threaten Canada's environment.

4.99 Canadian environmental policies and legislation, including the *Canadian Environmental Protection Act* (1999), identify pollution prevention as the preferred approach to ensuring a clean and healthy environment. Prevention is the first objective in the government's commitment to deal with the problem of invasive species.

4.100 Yet despite its 1992 and 1995 commitments to do so, the federal government has not established a comprehensive national program to identify and eliminate common sources of unintentional introductions and prevent further invasions.

4.101 The Government of Canada has also adopted the "polluter pays" principle in its environmental policy, meaning that whoever causes environmental degradation should pay for repairing (or preventing) the damage. We know that invasive species are frequently linked to the transportation of goods and people between ecosystems with different biologies. We know the Canadian-controlled ports of entry through which cargo arrives in this country.

4.102 Port and seaway authorities in Canada cover part of the cost of managing and maintaining their facilities by levying tolls on ships. The Canadian Food Inspection Agency also collects fees to cover the costs of protecting Canada's agriculture crops and forest trees from invasive pests that threaten them.

4.103 Yet no similar fees are in place to cover the cost of confronting invasive species that threaten Canada's ecosystems, though officials frequently cite the lack of new money as a major obstacle.

4.104 The precautionary principle, pollution prevention, and the concept of "polluter pays" have been part of Canada's environmental policies for more than a decade. The federal government is not applying them to manage invasive species that threaten our environment.

Conclusion

4.105 The federal government has not taken effective action to prevent the introduction of invasive species that threaten Canada's environment or to control or eradicate them. Despite continuing dialogue and deliberation, neither the United Nations Convention on Biological Diversity nor the Canadian Biodiversity Strategy has triggered an identifiable change in the government's approach.

4.106 In producing the 1995 Canadian Biodiversity Strategy, Environment Canada co-ordinated a written response to the United Nations Convention on behalf of the federal government. The strategy set out many of the steps needed to prevent the introduction of harmful alien organisms and to eliminate or reduce their adverse effects to acceptable levels. Unfortunately, Environment Canada has not succeeded since 1995 in co-ordinating a practical response to the problem.

4.107 It has not obtained the key information that it needs to effectively oversee or co-ordinate the federal government's response. It has not identified the invasive species that threaten Canada's ecosystems, habitats, and species; their most important paths of entry; or the risks they pose to Canada's environment and economy. It has not put together a national action plan or secured agreement among federal departments on who will do what to respond to major risks. Nor has it ensured that it has the tools it needs to determine whether measures that have been taken are working.

4.108 The Department needs to get on with this basic work. Otherwise, increases in trade and in the gross national product, clearly key economic goals of the federal government, will almost certainly lead to further invasions.

4.109 Until Environment Canada takes concrete steps to identify the invasive species that threaten Canada's ecosystems and the magnitude of the risk they pose to our environment and economy, it will find it extremely difficult to make a strong business case for the government to invest scarce resources in combatting the problem. It is clear, though, that not investing will carry a far greater cost.

About the Audit

In 1992, Canada and 167 other countries signed the United Nations Convention on Biological Diversity and pledged to prevent the introduction of or to control or eradicate alien species that threaten ecosystems, habitats, or other species. The Canadian Biodiversity Office was established at Environment Canada to co-ordinate a Canadian response; it produced the Canadian Biodiversity Strategy in 1995.

Objective

The objective of this audit was to determine whether the federal government has mounted an effective response to the invasive species problem since signing the Convention, and particularly since finalizing the Canadian Biodiversity Strategy. We set out to determine to what extent Canada's 1992 commitment and its 1995 strategy triggered a change in the federal government's approach to managing invasive species and the impact of any changes on prevailing trends.

Scope and approach

In our view, to assure Canadians that it is responding effectively to the problem of invasive species that threaten Canada's environment, the federal government must know what invaders pose the greatest risks to Canadian ecosystems, habitats, and species, and the major pathways by which they arrive; who is taking what action to respond to major risks; and how effective those actions have been in eliminating or reducing adverse effects to acceptable levels so that it can determine whether programs are working or whether corrective measures are required.

Because it is the lead department for Canada's biodiversity strategy, we looked to see whether Environment Canada on behalf of the federal government has that information or has put in place the basic tools it needs to acquire it. Since ship ballast water is the most important source of unintentional introductions of aquatic invaders, we also examined how the federal government is managing those species and that particular pathway. We looked at whether Fisheries and Oceans Canada has acquired the basic information it needs to manage aquatic invaders and whether Transport Canada has ensured that there is adequate legislation and enforcement to control their introduction or escape into Canadian waters from ship ballast.

To provide context for the government's commitment and for our observations and findings, the chapter presents case examples illustrating the nature and magnitude of the risks that invasive species pose to Canada.

Audit team

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Appendix A "Invasive Alien" As Defined by the Conference of the Parties to the United Nations Convention on Biological Diversity

(i) "alien species" refers to a species, subspecies or lower taxon, introduced outside its normal past or present normal distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce; (ii) "invasive alien species" refers to an alien species whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm (for the purposes of the present guiding principles, the term "invasive alien species" shall be deemed the same as "alien invasive species" in decision V/8 of the Conference of the Parties to the Convention on Biological Diversity.); (iii) "introduction" refers to the movement, by human agency, of a species, subspecies or lower taxon (including any part, gametes, seeds, eggs, propagules that might survive and subsequently reproduce) outside of its natural range (past or present). This movement can be either within a country or between countries; (iv) "intentional introduction" refers to the purposeful movement by humans of a species outside its natural range and dispersal potential (such introductions may be authorized or unauthorized); (v) "unintentional introduction" refers to a species utilizing unwitting humans or human delivery systems as vectors to disperse and become established outside its natural range, and (vi) "establishment" refers to the process of a species in a new habitat successfully reproducing at a level sufficient to ensure continual survival without infusion of new genetic material from outside the system.

Source: Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitat or Species. Report of the Sixth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, Conference of the Parties to the Convention on Biological Diversity, April 2002.

Appendix B The United States General Accounting Office Says Greater Commitment Needed to Manage Invasive Species Effectively

In 1998, President Clinton signed an executive order intended to improve co-ordination and focus among federal agencies with programs targeted at specific aspects of the invasive species problem. The executive order, among other things, created the interagency National Invasive Species Council and charged it with developing a national management plan for addressing the problems posed by invasive species.

The United States General Accounting Office (GAO) has reported in the past on funding for invasive species activities and the effectiveness of its rapid response capability.* Given the seriousness and complexity of the issues, in late 2001 the GAO initiated a review of the progress made under the executive order. Recognizing the international dimensions of the issue, as part of this work the GAO—in parallel with the Office of the Auditor General—undertook an evaluation of efforts to regulate discharges of ballast water in the Great Lakes, a key source of invasive species in these waters that affects both countries. More specifically, the GAO's objectives were to

(1) assess the usefulness to decision makers of studies that have estimated the economic impact of invasive species in the United States

(2) assess the National Invasive Species Management Plan, including the extent to which the United States government has implemented the plan

(3) provide the views of experts on the adequacy of U.S. and Canadian federal government efforts to prevent the introduction of invasive species into the Great Lakes via the ballast water of ships

(4) describe U.S. and Canadian co-ordination of invasive species management efforts

* See *Invasive Species: Federal and Selected State Funding to Address Harmful Nonnative Species*, (GAO/RCED-00-219, Aug. 2000) and *Invasive Species: Obstacles Hinder Federal Rapid Response to Growing Threat* (GAO-01-724, July 2001).

Appendix C "Time To Act" Says the International Joint Commission

In its 11th Biennial Report, the International Joint Commission admonished Canada and the United States to act on the problem of invasive species. Below is an excerpt.

Chapter 3—Great Lakes Water Quality Agreement

Conclusion

The introduction and spread of alien invasive species are continuing to impair the biological integrity and threaten the many water-dependent economic sectors of the Great Lakes basin. The costs for treatment and control are massive, rising, and largely borne by local communities, utilities and industry rather than those who create the problem.

Current regulations, guidelines, and practices in place are not sufficient to prevent further alien invasive species introduction and spread. Specifically, current regulations exempting ships declaring no ballast on board (NOBOB) do nothing to minimize the threat they pose. The Great Lake region's sense of the biological and economic urgency of the problem drives the call for more federal leadership and immediate steps to prevent further introduction and spread of alien invasive species.

Immediate federal action to make mandatory ballast water management practices, including the requirement for NOBOB participation in the program, can reduce the biologic and economic threat from the introduction and spread of alien invasive species. The time to act is now.

Recommendations

The Governments need to take more aggressive steps to end the invasion of alien species and we urge the following:

1. Immediately make existing voluntary guidelines for ballast water management practices mandatory and provide for measures of enforcement and compliance for all ships capable of carrying ballast water, including those currently not carrying ballast water.
2. Develop uniform protocols for performance testing of ballast water:
   a) Develop best practices and any improvements for ballast management operations.
   b) By the end of 2003 (date certain) establish enforceable interim biological standards.
   c) Concurrently, establish biological standards for ballast water discharges from all ships and for new technologies for ballast water treatment.
3. Ensure all ships built after a certain date have a treatment technology incorporated in their construction to be allowed entry into the Great Lakes.
4. Design and implement economic incentives to encourage shippers to continuously improve (ISO 14000) Ballast Management Practices.
5. Fund research recommended by expert regional, national and binational panels, task forces and committees, especially focused on:
   a) research (including research for biological standards, criteria and indicators) for ballast water treatment necessary to drive technology, product development, and ship design;
   b) research for developing alternative technologies including biocides to achieve new standards and criteria for the elimination of Alien Invasive Species in ballast water;
   c) research and technology development to reduce entrained and accumulated sediment in ship ballast water and tanks; and,
   d) research to develop analytical tools and procedures to permit the identification of new invasive species and to link these species to their possible points of origin and vessels of introduction.
6. Issue the Commission a reference to coordinate and harmonize binational efforts for action to stop this ongoing threat to the economy and the biological integrity of the Great Lakes.

Report of the Commissioner of the Environment and Sustainable Development to the House of Commons—2002

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Testimony Before the Senate Subcommittee on the Oversight of Governmental Management, Federal Workforce, and the District of Columbia

"Great Lakes Restoration Management:
No Direction, Unknown Progress"

Wednesday, July 16, 2003
10:00 a.m.

The Honorable Susan Garrett
Illinois State Senator
District 29

Testimony by the Honorable Susan Garrett

Good morning, Senators Voinovich and Durbin and members of the Subcommittee. It is an honor to testify before the Subcommittee today. Thank you for the invitation to share my views on the critical issue of Great Lakes restoration management.

The state and local government perspective

In 2002, I was elected to the Illinois State Senate to represent Legislative District 29. Before that, I served in the Illinois State General Assembly for two terms, representing Congressional District 59. Both of these districts include communities directly on the shore of Lake Michigan, and all of the communities I have represented are in close proximity to a local lake front recreational area.

As a public official, I know how much pride my constituents take in Lake Michigan. It is a place where families go to enjoy recreational activities like swimming and boating; the source of our drinking water; and an icon and resource for a variety of local and regional businesses. Part of my role as State Senator is to collaborate with other state and local officials on critical issues in my district. Collaboration and coordination is the key to successfully strengthening our communities.

The General Accounting Office report on the Great Lakes entitled, "An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals," makes several critical points, including the need for enhanced coordination and better data collection and monitoring. However, while the report discusses at length the role of federal agencies, Governors, and other organizations, it does not go in depth regarding the role of other public officials, including state legislators and municipal officials. Today I would like to share my perspective as a local official representing a district with very tangible ties to Lake Michigan, in order to add to the findings of the GAO report.

A local perspective

Great Lakes restoration is an environmental issue, but it is also an economic, educational, public health, and equity issue. My constituents value environmental protection efforts, because they want to see their children and grandchildren enjoy Lake Michigan just as they have. The ecological system of the Great Lakes is home to 250 species of fish and several protected coastal areas and other public lands. We need to protect this ecological system from environmental threats, including invasive species, pollution, and habitat destruction.

Today I want to tell you about one of the clearest challenges we face on the Illinois side of Lake Michigan: high e-coli contamination. The presence of the harmful e-coli bacteria requires regular and frequent beach closings in order to protect public health. As I am sure the Subcommittee will agree, this is not acceptable. My constituents consider Lake Michigan our most valuable natural resource. We can no longer allow for our beaches to be closed so often during the summer months, without any real understanding as to what is causing these extremely high bacteria levels.

Some have claimed that sea gulls are the culprit of the e-coli contamination. Others say raccoons and deer. Human sewage is another serous consideration. Locally, I have established a Clean Water Trust Fund that will provide the funding (much of which is grassroots) to do necessary testing that will determine the cause or causes of the e-coli contamination. The objective is to independently raise a minimum of $25,000 to cover the costs of an e-coli water sample study to determine whether sea gulls, deer, human sewage, or a combination of these elements are leaving harmful contaminants in Lake Michigan.

While we must work together throughout the Great Lakes region, we must not ignore the fact that a lot of problems need local involvement and localized solutions. That is why we are working with several state and local entities, including the Illinois Department of Public Health, Illinois Environmental Protection Agency, Lake County Health

Department, Lake Michigan Federation, Baxter, Chicago Medical School and two independent scientists to pursue this study. This broad-based group of stakeholders indicates the strong level of local interest and expertise in these issues, but also highlights how important it is to coordinate and not duplicate efforts.

Since embarking on this research effort, we have received e-mails and letters asking for more information from other communities and states such as Michigan. These kinds of responses indicate a clear need for local, state and federal governments to be more proactive in understanding the water quality of Lake Michigan (as well as the other Great Lakes) and to map out a plan to reverse the current trend of pollutants continually threatening our Great Lakes. It also shows the need for a more comprehensive approach to collecting and understanding environmental data and indicators.

Recommendations for improving Great Lakes restoration management

As a public official, I can say one of the most important things is to have a central office to go to with Great Lakes concerns and questions. We need a go-to person, and a one-stop shopping place where we can access the resources and programs that can help us work together to restore the Great Lakes.

For this reason, I am especially interested in the opportunity for the Great Lakes National Program Office to provide more coordinated efforts on the issue of water quality, which is part of the DeWine-Levin proposed legislation that I understand the Chairman and Ranking Member support. It is critical to have a strategic, collaborative approach to improving the water quality of our Great Lakes.

In addition, I support the establishment of an Advisory Board, another piece of the Senate and House legislation, which will help bring all of the stakeholders together to plan for the future of our Great Lakes. It is especially critical to engage the participation of mayors and other public

officials on this Board. Local citizens' groups and other forums for public participation are also essential.

I also support the Senate legislation, similar to what will be introduced in the House, because it would generate a significant federal investment in the Great Lakes.

Finally, I support the Senate bill's provisions to create a systematic approach to collecting data on the pollutants and other environmental indicators in our Great Lakes.

Thank you for listening to my perspective and recommendations. I am happy to answer any questions the Subcommittee may have, and I look forward to our continued work together on Great Lakes issues.

BOB TAFT
CHAIRMAN
Governor of Ohio

ROD BLAGOJEVICH
Governor of Illinois

JIM DOYLE
Governor of Wisconsin

JENNIFER M. GRANHOLM
Governor of Michigan

FRANK O'BANNON
Governor of Indiana

GEORGE E. PATAKI
Governor of New York

TIM PAWLENTY
Governor of Minnesota

ED RENDELL
Governor of Pennsylvania

Testimony of Christopher Jones
Director, Ohio Environmental Protection Agency
and
Chairman, Great Lakes Priorities Task Force
Council of Great Lakes Governors

"Great Lakes Restoration Management:
No Direction, Unknown Progress"

Senate Subcommittee on Oversight of Government Management

July 16, 2003

The Honorable George V. Voinovich, Chairman

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Testimony of Christopher Jones
Director, Ohio EPA
and
Chairman, Great Lakes Priorities Task Force
Council of Great Lakes Governors
before the
Senate Subcommittee on Oversight of Government Management
July 16, 2003

Senator Voinovich, members of the subcommittee, thank you for allowing me to appear today on behalf of Governor Bob Taft to represent the Council of Great Lakes Governors on the important topic of restoring one of the world's most important ecological treasures, the Great Lakes. As the largest single source of fresh surface water in the world, the Great Lakes provide drinking water to millions, serve as the base of commerce and recreation for an entire region, and function as a transportation hub that serves the nation and the world.

The region's governors are pleased with the leadership Congress has shown in recognizing the critical importance of the Great Lakes and the pressing need to restore and safeguard them for generations to come. We particularly commend Senators DeWine and Levin for the introduction of their restoration bill this week.

The Great Lakes Governors recognize the need for an overarching plan that identifies specific restoration goals, establishes priorities, specifies measures of success, and serves as a coordinating focus for the many federal, state, and local programs directed at Great Lakes restoration. Toward that end, the Council began working on the Great Lakes Priorities project in 2001. The goal of the project is to develop just such a plan, in consultation with Great Lakes mayors and other stakeholders. With the plan serving as both a scientific foundation and a policy funding consensus, the Great Lakes community can work with Congress to identify and procure the funding necessary to fully achieve its goals.

We are somewhat behind the original schedule we set for ourselves, as five newly elected Governors in the Great Lakes states have needed time to familiarize themselves with the restoration programs in their states and the aim of the Council to coordinate a basin-wide approach. Recent conversations between Governor Taft and several other Great Lakes Governors, however, confirm the joint purpose and resolve of the Council. In fact, we are near to having a final set of priorities for Great Lakes restoration.

Our priorities reflect broad goals such as protection of human health, restoration of habitat, and control of invasive species. The Council believes that the bills now pending in the House and Senate offer an opportunity to focus much needed financial resources on these priority needs. At the same time, the Governors wish to be clear that it is likely that restoration costs for the national treasure that is the Great Lakes ecosystem could run well beyond $6 billion. A more precise figure cannot be arrived at absent the development of a comprehensive plan.

What is important in the near term is continuing the focus on restoration efforts. The DeWine-Levin bill does just that. Both states and the federal government have made

substantial investments in this important resource and we want to expand and continue that good work.

The Council has already demonstrated its commitment to collaboratively address Great Lakes issues on a region-wide scale through Annex 2001, an amendment to the Great Lakes Charter that addresses water diversions and in-basin consumptive uses from the Great Lakes. The Council is well on its way to meeting the Annex's three-year timeline for the development of binding agreements which will include a decision-making standard to guide water withdrawals. This will also achieve the first of the Governors' priorities.

The recent report by the General Accounting Office (GAO) notes that States devoted nearly a billion dollars in the time period reviewed to Great Lakes-specific projects, versus $745 million spent by federal agencies and the Corps of Engineers together. Illinois, for example, has spent $6 million to restore coastal habitats. Michigan has committed $25 million to sediment remediation, while Minnesota spends $1.2 million each year to control invasive species. New York has devoted approximately $22 million to open space preservation projects in the Great Lakes Basin. In Ohio, we have directed $25 million to conservation projects in the Lake Erie basin. The region's governors have individually and collectively demonstrated the will and the leadership to invest in a wide range of restoration projects, and stand ready to pull together a region-wide plan that can guide further progress.

A necessary component of that plan will be environmental indicators by which progress can be measured. I know that you've spoken of the need for a set of indicators for all the Great Lakes, Senator Voinovich, similar to the Lake Erie Index developed while you were Ohio's Governor. The GAO report correctly notes that the development of indicators has been the purpose of the State of the Lake Ecosystem Conferences (SOLEC) over the past several years, and that a set of indicators has not been finalized. No one should underestimate what a difficult task this is, especially given the diversity and geographic expanse of the Great Lakes Basin. Nevertheless, it is imperative that this effort move forward more expeditiously than has been the case to date. A good system of indicators will form the basis of both accountability and measurement of success.

The GAO report also acknowledges that there have been many successes stemming from Great Lakes restoration efforts to date. As a comprehensive plan is developed, we must keep in mind these successful efforts and build upon them. Unfortunately, one of the most productive efforts is currently threatened by, frankly, bureaucracy.

Anyone familiar with the progress of restoration on the Great Lakes knows that much is attributable to the Remedial Action Plan – or RAP – groups working on the Areas of Concern, along with state environmental staff who provide them support and technical assistance. Unfortunately, federal financial support for this highly successful state and local partnership has been drastically reduced. Now funding to support RAPs has been transferred to the Great Lakes National Program Office – GLNPO – which distributes all funds on a project-by-project basis. Therefore, states must now apply for multiple small grants for specific tasks, rather than for one grant supported by a work plan. This inefficient approach jeopardizes our ability to continue the most successful efforts underway to reclaim our Lake and its tributaries. Further, decreased federal support for state Great Lakes programs will make it all but impossible to implement any

comprehensive restoration plan successfully. I ask that Congress be mindful of the need to help fund state capacity to carry out Great Lakes restoration.

The Governors find much to commend in the GAO report, and agree with its primary conclusion that the multitude of programs directed at the Great Lakes need to be better coordinated and focused. However, the Council disagrees with its recommendation that restoration efforts be directed by GLNPO. Clearly, GLNPO has an important role to play, particularly with regard to the bi-national aspects of Great Lakes restoration. Other existing Great Lakes organizations and stakeholders are also key players. For example, the Great Lakes Commission can contribute valuable scientific and technical expertise. But we believe that it is the role of the region's Governors to establish policy priorities, in consultation with local governments and other stakeholders, and to plan specific activities to achieve those priorities.

Along with the legislation introduced Monday, the Governors urge Congress to take up reauthorization of the Great Lakes Legacy Act and the Non-Native Aquatic Invasive Species Act. These laws address the key issues of contaminated sediments and invasive species and should be fully funded.

In summary, Senator Voinovich and members of the subcommittee, the Council of Great Lakes Governors wishes to affirm its commitment to restoring the Great Lakes ecosystem and to express its willingness to work in close cooperation with the Great Lakes Congressional delegation to achieve that end. Thank you.

TO: The Senate Subcommittee on Oversight of Government Management
FR: Margaret Wooster, Executive Director, Great Lakes United
RE: Testimony for "Great Lakes Restoration Management" hearing
DT: July 16, 2003

Dear Mr. Chairman and Subcommittee members:

Thank you for inviting Great Lakes United to testify today concerning government management in the context of Great Lakes ecosystem restoration. We applaud the leadership of members of the Great Lakes Task Force in both the House and Senate in bringing this issue to the fore. We support these efforts to promote Great Lakes restoration and look forward to working with you to make this happen.

Great Lakes United is an international coalition of individuals and over170 organizations representing hundreds of thousands of individual from the eight Great Lakes states, two Canadian provinces and tribal territories within the Great Lakes region. Our main constituents are environmental organizations like National Wildlife Federation, Lake Michigan Federation, Sierra Club; conservation organizations like Trout Unlimited; and labor groups like Canadian Auto Workers and United Auto Workers. We work at the local, regional and international level on projects, programs and policies to protect and restore the health of the Great Lakes-St. Lawrence River ecosystem. To this end, over the past two years Great Lakes United coordinated thirty Great Lakes groups in the creation of a citizens "Action Agenda," a summary of which, *The Great Lakes Green Book,* is presented with this testimony.

We essentially agree with the findings of the April 2003 GAO report on Great Lakes management. *Similar findings have been issued by Canada's auditor general, who concluded "the federal government [of Canada] is uniquely positioned to take a basin-wide perspective, but so far it has not. The quality of existing data sets is deteriorating; the federal capacity is going in the wrong direction."*

Inadequate data and poor government coordination are evidenced in declining ecosystem health. Human health advisories against eating the fish, swimming in the waters, and breathing the air are increasing across the region. On Lake Erie, four years of an avian botulism epidemic has killed tens of thousands of loons and other fish-eating birds, and a dead zone of oxygen-less water covered two-thirds of the basin last August. The fact that this came as a surprise to Great Lakes managers tells us everything about current monitoring. Human health effects from contaminated air, soil and sediments range from high regional cancer rates to lower I.Q.s in children of mothers who eat Great Lakes fish. In a 2002 State of the Lakes Ecosystem report, US and Canadian scientists ranked 70 percent of lake health indicators as "mixed," "mixed deteriorating" or "poor." Among those indicators are increasing trends in per capita consumption of energy and water, which will place additional stress on an already beleaguered ecosystem.

The GAO report rightly points out that we need an overarching strategy that clearly defines agency roles and priority funding for Great Lakes restoration. We would like to elaborate on four major needs raised in the report: funding, agency coordination, public involvement and the need to go beyond existing policies and programs.

Funding. For at least the past decade there has been a lack of funding for even the most basic protection and restoration efforts like monitoring and clean-up. For example, although the International Joint Commission identified 31 US toxic hotspots causing harm to humans and wildlife almost 20 years ago, these 31 hotspots still exist today. The IJC estimates it will cost $7.4 billion to clean them up. Congress recently approved the Great Lakes Legacy Act, authorizing $53 million per year for five years for sediment clean-up, which we hoped would restart clean-up efforts, but the funding proposed in the 2004 budget was only about one-third of that or .2% of the total estimated cost.

We need a dedicated revenue stream over a period of at least 10 years sufficient to complete the job. Every year we wait makes the job harder and costlier, and prolongs a major source of ecosystem damage.

Many Great Lakes protective programs are consistently under funded including those administered by GLNPO, the Great Lakes Fishery Commission and the US Fish and Wildlife Service. Yet elimination of toxic discharges, sea lamprey control and restoration of native species, to name a few of the affected programs, are critical to Great Lakes recovery.

Government coordination. At this point in time there is no one federal agency and no consortium of state agencies with the capacity to develop and oversee a Great Lakes restoration initiative. We need an independent body (not controlled by any one agency), which defines goals, targets and timelines and accordingly prioritizes the projects that should be funded. This body should be led by the region's representatives – federal, state, local and tribal – with strong citizen involvement, strong public accountability in terms of meeting its charge, and a mechanism for cross-border coordination. It should define criteria for funding projects to help leverage restoration goals.

For example, states eligible for funding would have to demonstrate that they have plans in place for achieving water conservation or pollution prevention goals. Projects eligible for funding would have to demonstrate benefits consistent with restoration goals. All agencies involved in projects would enter into cooperative agreements that clearly delineate their roles and timelines.

Public involvement: There must be a strong public role in Great Lakes protection and restoration. The public must be represented on any advisory body, federal or state, that determines a restoration plan, priorities or fundable projects in order to help guarantee the ongoing integrity of the process. There must also be opportunity for wide public comment on restoration plans at strategic points in their development.

Please refer to testimony submitted by the Michigan Environmental Council for more specific recommendations concerning public involvement.

Policy change: There are also a number of policy and institutional changes that are critical to Great Lakes restoration and future protection. I will offer here just two examples.

1. We need to extend the focus of our strategies beyond reacting to ecosystem harm, to proactive initiatives. For example, toxic reduction strategies must include support for policies and programs that create alternative choices in Great Lakes communities such as incentives for resource conservation, green energy, and pollution prevention.
2. We need to carefully appraise the mandates of existing institutions with the greatest influence on Great Lakes waters such as the US Army Corps of Engineers, who accounted for almost half the U.S. federal environmental spending in the Great Lakes over the past ten years, according to the GAO report. The Corps's traditional mandate has been to protect and enhance private property, not ecosystems. In fact, improvements in the name of flood control, navigation and shoreline hardening are usually directly detrimental to ecosystem health. Therefore it is important that if agencies like the Corps are to have a role in Great Lakes restoration, that it be tightly defined and publicly accountable.

Thank you again for this opportunity to speak.

TESTIMONY SUBMITTED TO:
SUBCOMMITTEE ON OVERSIGHT OF GOVERNMENT MANAGEMENT
COMMITTEE ON GOVERNMENTAL AFFAIRS
U.S. SENATE
JULY 16, 2003

PREPARED BY:
MICHAEL J. DONAHUE, PH.D.
PRESIDENT/CHIEF EXECUTIVE OFFICER
GREAT LAKES COMMISSION

The Great Lakes Commission applauds the subcommittee's initiative in holding a hearing on ecosystem restoration needs and initiative in the Great Lakes basin. The eight Great Lakes states, acting though the Commission, have long supported the notion of a comprehensive, consensus-based ecosystem restoration plan to enhance inter-jurisdictional and interagency coordination, and provide a blueprint for Congressional action. We are pleased that the recent U.S. General Accounting Office (GAO) report, titled, *An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals,* has brought additional attention to this unmet need.

We believe that any such plan must reflect the priorities of our governors; represent a true partnership among all levels of government; recognize the binational status of the resource; be based on sound science; have the backing of the Great Lakes Congressional Delegation; reflect the views and enjoy the popular support of diverse stakeholders; build upon existing programs, authorities and institutions; include measurable goals; establish clear lines of accountability for implementation; and be supported by significant, long-term sustainable funding.

The following testimony presents the Great Lakes Commission's perspectives and recommendations on this subject. It presents an overview of the Great Lakes Commission; discusses its role, responsibility and initiatives in ecosystem restoration; builds a case for a *Great Lakes Restoration Plan*; presents comments on the recently released GAO report; highlights Great Lakes Commission contributions to restoration planning (current and prospective); and offers recommendations reflecting the collective views of the Commission's membership as embodied in resolutions and policy statements. Included is a descriptive overview of a recently announced partnership with the National Oceanic and Atmospheric Administration's National Sea Grant College Program that promises to significantly advance ecosystem restoration efforts in the Great Lakes Basin.

Overview of the Great Lakes Commission

The Great Lakes Commission is a binational agency that promotes the orderly, integrated and comprehensive development, use and conservation of the water and related natural resources of the Great Lakes Basin and St. Lawrence River. The Commission was established by joint legislative action of the Great Lake states in 1955, via the Great Lakes Basin Compact, and granted congressional consent in 1968 through Public Law 90-419. Commission members include the eight Great Lakes states, with associate member status for the Canadian provinces of Ontario and Québec

secured through a 1999 Declaration of Partnership. Each jurisdiction appoints a delegation of three to five members comprised of senior agency officials, legislators and/or appointees of the governor or premier. All Commission activities are directed at realizing our vision of a healthy environment, a prosperous economy, and a high quality of life for all citizens. Three principal activities support this vision:

- Information sharing among the membership and the entire Great Lakes-St. Lawrence community
- Policy and plan research, development and coordination on issues of regional interest
- Advocacy of those positions on which members agree.

The Great Lakes Commission has a legislative mandate to represent the collective views of the eight Great Lakes states before the Congress and the federal government.

The Great Lakes Commission and Ecosystem Restoration: Role, Responsibility and Initiatives

In passing the Great Lakes Basin Compact, The U.S. Congress and the legislatures of the eight Great Lakes states established an organization with an explicit mandate to plan for and promote the "orderly, integrated, and comprehensive development, use , and conservation" of the water and related natural resources of the Great Lakes Basin and St. Lawrence River. Article I of the Compact (PL 90-419) provides for this planning function, and calls on the Commission to address environmental, economic and quality of life considerations in offering advice and recommendations on management of the Basin's resources and their uses. Articles VI and VII further specify the nature and purpose of the Commission' planning, coordination, analysis and recommendatory functions, and identify the range of topical areas to be addressed.

The Commission's role and responsibility in ecosystem planning is further established in its *Five Year Strategic Plan*, unanimously adopted by its membership in 2000. In that document, the membership articulates a vision for the Great Lakes St. Lawrence system - a "system that offers a prosperous economy, a healthy environment and a high quality of life for its citizens by applying sustainable development principles in the use, management and protection of water, land and other natural resources." To achieve that vision, the Commission provides a series of goals, objectives and strategic actions that address the need for a well-coordinated, comprehensive and consistent approach to advancing environmental and economic prosperity.

The Great Lakes Commission's involvement in large scale ecosystem planning dates back to its formation in 1955 and a succession of planning initiatives since that time that have addressed a range of issues associated with the use, management, restoration and protection of the resource. In recent years, among many others, the Great Lakes Commission has developed such plans and strategies on issues that include aquatic nuisance species prevention and control; water quality management; nonpoint source pollution control; Areas of Concern clean-up; environmental monitoring; environmental and commercial dredging; land re-use and preservation; regional air toxics emissions; lakewide restoration; wetlands conservation and health; and a sustainable transportation system. Such plans have been integrative in nature, accommodating and addressing the range of environmental and economic considerations that determine ultimate success in restoration, protection and management efforts.

The Great Lakes Commission has also historically assumed a coordinative role in advancing ecosystem planning efforts by strengthening linkages and cooperative efforts within a complex "institutional ecosystem.". Such complexity, along with the multitude of "players" in the basin governance process, has historically led to some confusion among elected officials, other policy makers and the general public. Commonly asked questions have included, "What are the roles and responsibilities of the various Great Lakes agencies? "Who speaks for the Great Lakes?" And, "Is there a shared vision for the Great Lakes and a plan, or blueprint, to achieve it?"

In the mid-1990s, the Great Lakes Commission coordinated a response to the latter question with the development of *An Ecosystem Charter for the Great Lakes-St. Lawrence Basin.* That document, which consisted of a vision statement, set of principles and a series of goals, objectives and strategic actions, was the product of a large binational drafting committee comprised of federal, state and provincial officials, and representatives of business/industry interests, citizen organizations, user groups and academia. The intent was to highlight fundamental resource management principles that enjoyed broad support. In essence, the Ecosystem Charter is an affirmation that the members of the Great Lakes community are generally "in the same boat and rowing in the same direction." Once completed, the Ecosystem Charter garnered the signatures of approximately 175 agencies, organizations and other entities. Its principles and related provisions remain largely relevant today.

The Great Lakes Program to Ensure Environmental and Economic Prosperity

The most recent contribution of the Great Lakes Commission to large scale ecosystem restoration planning is embodied in *The Great Lakes Program to Ensure Environmental and Economic Prosperity.* The program is an annually produced descriptive listing of the U.S. federal legislative and appropriations priorities of the eight Great Lakes states articulated through the Great Lakes Commission. Reflecting the input of the larger Great Lakes - St. Lawrence community and garnering the unanimous support of its eight member states, the program sets forth seven goals that include cleaning up toxic hotspots; shutting the door on invasive species; controlling nonpoint source pollution; restoring and conserving wetlands and critical coastal habitat; ensuring the sustainable use of our water resources; strengthening our decision support capability; and enhancing the commercial and recreational value of our waterways. Associated with each is a benefits statement and series of "selected priority actions" for Congressional consideration.

The genesis of *The Great Lakes Program* dates back to the Commission-sponsored "Great Lakes Day in Washington" in March 2000. At that event. Congressional staff recommended that the Commission re-orient its long-standing list of appropriations priorities to reflect a common theme and consistent set of goals. "Restore the Greatness" was subsequently adopted by member states as the theme and, in subsequent years, *The Great Lakes Program to Ensure Environmental and Economic Prosperity* has emerged as a much-consulted blueprint for Congressional action.

The Great Lakes Program is an important step toward the development of a large scale, long term *Great Lakes Restoration Plan.* In fact, a key recommendation in the 2003 version is the development, via intergovernmental partnership, of such a plan that reflects the collective priorities of the region's governors and is based on regionwide consensus of the stakeholder community.

The Case for a Great Lakes Restoration Plan

The ecological and economic importance of the Great Lakes basin, coupled with its size, multiple use and multi-jurisdictional characteristics, has fostered the development of a complex set of institutional arrangements for its management. Policymaking and management authority is shared by two federal governments, the Commission's eight member states, its two associate member provinces (ON, QC), a multitude of First Nations/tribal authorities, several regional agencies, and literally hundreds of sub-state/provincial governments. Inter-agency agreements and cooperative arrangements are a common feature on the governance landscape, and there is growing recognition that an ecosystem-based, partnership-oriented approach is a fundamental component of successful basin governance.

While initiatives such as the *Ecosystem Charter* speak to the long standing interest in the *Great Lakes Restoration Plan* concept, the heightened awareness of this need is largely attributable to several recent developments. Congressional support for the "Comprehensive Everglades Restoration Plan," a multi-year, multi-billion dollar initiative, emphasized the benefits to be realized if all players in a given region pulled together and supported a single plan. It also prompted many in the Great Lakes basin to wonder if this region – historically the leader in institutional innovation and collaboration – might be "losing its edge." Also, the Great Lakes Commission heightened regional interest in a comprehensive, consensus-based plan when it released (in March 2001) its annual U.S. federal legislative and appropriations priorities in the form of *The Great Lakes Program to Ensure Environmental and Economic Prosperity.* And, a multitude of other public agencies with Great Lakes responsibilities – particularly U.S. federal agencies – have recently launched comprehensive strategic planning initiatives that speak – to varying degrees – to the *Great Lakes Restoration Plan* idea. The Congressional Great Lakes Task Force reaffirmed the desirability of a region-wide, consensus-based plan that could help inform and direct its legislative/appropriations efforts, and invited the Great Lakes governors (in a letter dated March 1, 2001) to help coordinate contributions to that effort. In making that request, it was emphasized that the plan needs to originate in the region and garner broad-based support among the range of regional interests.

The building blocks for development of a *Great Lakes Restoration Plan* are already largely in place; numerous agencies at all levels of government, as well as nongovernmental interests, maintain (or are in the process of developing) strategic plans that can contribute to a broader, consensus-based *Great Lakes Restoration Plan.* Among many others, the following are relevant:

- As noted earlier, the Great Lakes Commission has developed, on behalf of its member states and provinces, a *Five Year Strategic Plan* (2000) that presents a vision statement, goals, objectives and strategic actions. Its annual U.S. federal legislative and appropriations priorities statement *(The Great Lakes Program to Ensure Environmental and Economic Prosperity)*, formally adopted by its eight state members, includes several dozen recommendations organized around seven themes. And, as also noted previously, the Commission coordinated the development of the *Ecosystem Charter for the Great Lakes-St. Lawrence Basin* in 1995.

- The U.S. Policy Committee, with coordination assistance from the U.S. Environmental Protection Agency (Great Lakes National Program Office), has developed a *Great Lakes*

Strategy. The U.S. Policy Committee is a consortium of U.S. federal, state and regional agencies with responsibilities related to implementation of the U.S. Canada *Great Lakes Water Quality Agreement*.

- The International Joint Commission has developed a strategic plan to guide its efforts – and those of its boards – under the terms of the *Boundary Waters Treaty of 1909* and the U.S.-Canada *Great Lakes Water Quality Agreement* of 1972 (as amended by Protocol in 1987).

- The Great Lakes Fishery Commission maintains a *Joint Strategic Plan for Management of Great Lakes Fisheries* which was developed and endorsed by federal, state and tribal governments. It provides the agency and its many partners with a framework for individual and collective fisheries management activities.

- The National Sea Grant Program maintains a *Sea Grant Network Plan* that highlights the agency's role in economic leadership; coastal ecosystem health and public safety; and education and human resources. Complementing this are strategic plans specific to each Great Lakes Sea Grant Program.

- The U.S. Army Corps of Engineers (Great Lakes and Ohio River Division) recently initiated a strategic planning process under provisions of the *John Glenn Great Lakes Basin Program* authorized in the Water Resources Development Act of 1999. The objective is to define Corps authorities, inventory current activities, and document unmet needs and partnership opportunities. The Corps is also initiating – per Congressional directive – a *Great Lakes - St. Lawrence Seaway System Review Study* that will examine issues, unmet needs and opportunities associated with the Great Lakes-St. Lawrence maritime transportation system with a significant focus on environmental baseline conditions. Also, the Corps is partnering with the Great Lakes Commission – and multiple U.S. and Canadian agencies from the local to federal level – on development of a comprehensive management plan for the St. Clair River and Lake St. Clair watershed.

- The U.S. Geological Survey has developed a draft strategic plan that outlines its own Great Lakes mandate and identifies future priorities. It identifies major societal issues that USGS can address, and provides for the appointment of a Great Lakes Coordinator, a Great Lakes Technical Team and a Great Lakes Coordination Outreach Team. Approval of the draft plan is anticipated in the near future.

- The Great Lakes Environmental Research Laboratory (NOAA) crafted a strategic plan in 2000 that presents a mission statement and a series of associated goals, related activities, products and strategic actions. As with the other selected plans identified above, interagency collaboration and partnership are prominently featured.

- State and province level initiatives exist as well. Among others, New York has developed a 25 year *Great Lakes Management Plan*; Ohio has developed a restoration plan for Lake Erie; and Michigan's Office of the Great Lakes has issued strategic planning documents, including a *Lake Huron Initiative*. Literally every Great Lakes state and province has some type of Great Lakes strategy, whether it be statewide, agency-specific or topic-specific. Among others, states/provinces have plans that address one or more of the following: aquatic nuisance

species prevention and control; coastal management; nonpoint source pollution; water use/conservation; spill prevention and response; land use and air quality management. Further, the Congress is presently providing substantial restoration grants to individual Great Lakes states.

- Complementing these activities are issue-specific strategies at the regional level that have restoration plan relevance. Among many others are the strategic plans of the Great Lakes Commission-coordinated Great Lakes Panel on Aquatic Nuisance Species; the binational Waterways Management Forum (coordinated by the U.S. Coast Guard); and the elements of *Annex 2001* of the Great Lakes Charter endorsed by the Great Lakes governors and premiers.

The proliferation of strategic planning initiatives within Great Lakes-related institutions is appropriately viewed as a strength. At the individual agency level, such plans are instrumental in defining roles and responsibilities, articulating unmet needs, identifying partnership opportunities, and formulating visions and blueprints to achieve them. Generally speaking, their development is collaborative and inclusive. Even a cursory review of their respective provisions finds that there are, indeed, many areas of fundamental agreement that suggest we are "in the same boat and rowing in the same direction."

What we have, however, is a necessary but insufficient condition for moving the basin's restoration needs forward. These many strategies and plans need to be "massaged" into a single, states-led, comprehensive, plan that accommodates and reflects the input from a range of interests in the binational region. This will yield the collective vision needed to achieve success at the Congressional, gubernatorial and state legislative levels, and provide us with a clear understanding of where we are, where we want to be, and how to get there. Working with its member states, the Great Lakes Commission has committed to assisting with this effort by providing technical and scientific support to the region's governors and premiers and the larger Great Lakes - St. Lawrence community.

Perspectives on the U.S. General Accounting Office Report

The Great Lakes Commission applauds the recent release of the GAO report *(An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals)* and urges careful consideration of its recommendations. Report findings re-affirm concerns our membership has expressed in recent years through formal resolution and other policy positions. Simply stated, we need an overall plan with a consensus-based vision, goals, objectives and strategic actions by which the restoration and protection efforts of governmental agencies at all levels can be conducted.

The GAO did a commendable job of documenting current federal and state restoration programs and in characterizing the nature and focus of current coordination efforts. It also conveyed the complexity of institutional arrangements and the enormity of the restoration challenge. The fact that its authors concluded that current indicators provide an inadequate basis for assessing restoration progress is testament to the need for a more comprehensive and coordinated approach to establishing and benchmarking goals.

While the Great Lakes Commission supports the overall findings and recommendations of the report, several observations with implications for any prospective plan development are in order:

- The descriptive inventory of restoration-related programs and projects is, by GAO admission, extensive but incomplete. It does not capture many of the ongoing state and federal initiatives, not to mention those funded outside of government (e.g., foundations, private sector), or pursued by other governmental (e.g., regional and sub-state entities) and non governmental entities. The Great Lakes Commission, for example, is directing over $8.0 million to its regional initiatives in FY 2004, many of which have a restoration focus. As a restoration planning process moves forward, the GAO inventory effort should be expanded.

- The Great Lakes "institutional ecosystem" is arguably the most complex and mature arrangement for basin governance in the world. There are a multitude of institutions, restoration plans and coordinative mechanisms already in place. Adding to this complexity through new institutional arrangements – at least without thoroughly exploring the potential of existing ones – is counterproductive. Most of the pieces of the restoration plan puzzle are already available, and the emphasis should be placed on assembling them, rather than on duplicating or re-inventing them.

- The report appears to overstate the relevance of the U.S. - Canada *Great Lakes Water Quality Agreement* – at least in its current form – to ecosystem restoration efforts. This is due to the fact the that current agreement is 16 years old and is rapidly becoming a memorial to the past rather than a beacon for the future. An updated – and potentially expanded – Agreement is fundamental to the success of any prospective restoration plan. The Great Lakes Commission has long been on record in support of Agreement review.

The Great Lakes Commission's Contribution to Development of a Great Lakes Restoration Plan

Through formal resolutions, policy statements and project initiatives, the Great Lakes Commission has identified several areas where it has, and will continue to advance the collective effort toward development and implementation of a *Great Lakes Restoration Plan.*

- Technical and Scientific Support to the Great Lakes Governors and Broader Regional Leadership: The Great Lakes Commission, as an organization of the Great Lakes states and provinces, recognizes the leadership role of the Great Lakes governors, in consultation with their counterparts in Ontario and Québec, in establishing overarching ecosystem restoration priorities and subsequent development of a *Great Lakes Restoration Plan.* Toward that end, the Commission has made available its considerable resources and technical expertise in restoration plan design, formulation, implementation and monitoring.

- Legislative Review and Analysis: Consistent with its mandate, the Great Lakes Commission will both contribute to and respond to federal legislative initiatives involving restoration planning and appropriations legislation, ensuring that the collective interests of the Great Lakes states are represented.

- Enhancing Intergovernmental and Interagency Coordination in Plan Development: Through its membership, Observer program (for non-state public agencies) and various coordinating mechanisms (e.g., committees, task forces, meetings), the Great Lakes Commission will continue to provide a forum for all basin interests – both within and outside government – to contribute toward plan development and implementation. In turn, the Great Lakes Commission will continue to participate in the many existing regional forums (e.g., International Joint Commission, U.S. Policy Committee, Binational Executive Committee) where such coordination efforts will also move forward.

- Identify Restoration Priorities and Associated Scientific Considerations: Thanks to support from NOAA and its National Sea Grant College Program, the Great Lakes Commission is partnering with the Great Lakes State Sea Great Programs on an ambitious two-year initiative that will involve researching ecosystem problems and needs; assessing existing restoration initiatives; conducting focus groups to identify priorities; and convening a restoration planning forum to assemble outcomes and convey them to Basin leadership and stakeholders. The process will be an inclusive one and will welcome the involvement of all interests in the binational Great Lakes-St. Lawrence basin. The outcome will be science-based data and information on prospective restoration priorities, as well as advice and observations on plan formulation, implementation and monitoring.

  This initiative will yield benefits for all concerned. It will provide the Great Lakes governors and premiers with detailed, science-based information needed to formulate, refine and advocate restoration priorities. It will assist the Great Lakes Commission in shaping and advancing its annual compilation of federal legislative and appropriations priorities. Similarly, it will assist Sea Grant in its ongoing efforts to target resources to research, education and extension priorities. Further, it will complement multiple other restoration plan contributions from entities within and outside of government.

Recommendations of the Great Lakes Commission

In considering the preparation of a *Great Lakes Restoration Plan*, via Congressional action or other means, the Great Lakes Commission offers the following recommendations:

1. **Experiences, both withing the Great Lakes-St. Lawrence Basin and in other regions of North America, suggest that a successful ecosystem restoration planning process must provide, among others, for the following:**

   a) gubernatorial leadership in plan formulation, in partnership with all relevant levels of government;
   b) a sound scientific basis and rationale for all restoration goals and associated tasks and activities;
   c) strong bipartisan support from the Great Lakes Congressional Delegation;
   d) an open and inclusive development process that reflects the views and cultivates the support of stakeholder groups;
   e) involvement most of relevant Canadian interests in the process, recognizing that restoration efforts must be pursued on a basinwide and, hence, binational basis;

f) use of existing institutions, programs, authorities and plans as a basis for plan development and implementation, fully exploiting their potential;
g) benchmarking (and associated monitoring) of all goals, tasks and activities to ensure that progress can be measured over time and with appropriate adjustments made;
h) establishment of clear lines of authority and accountability for implementation;
i) an overarching set of principles that can provide general guidance for, and ensure consistency among other restoration plans and activities of any scale; and
j) significant, long-term, sustainable funding consistent with documented needs.

2. ***The Great Lakes Program to Ensure Environmental and Economic Prosperity* should be used as a foundation for plan development**. This document, which includes a vision statement, seven overarching goals, and some 50 priority actions, has been unanimously endorsed by the Board of Directors of the Great Lakes Commission and reflects the consensus of the states acting through the Great Lakes Commission. Significantly, the Program is based both on federal programs that have been authorized, yet inadequately funded, and no new start initiatives of interest to the states. Complementing the incorporation of Program elements into the plan should be a similar exercise for many other restoration-related plans and strategies that have been developed in recent years. Principal among these is the *Great Lakes Strategy* endorsed by the U.S. Policy Committee and coordinated by U.S. EPA.

3. **Plan development and implementation must be results oriented, and pursued with a sense of urgency**. Establishment of a new bureaucracy, particularly in light of the array of existing institutions, programs, policies, plans and coordination mechanisms, must be avoided. Rather, the full potential of existing arrangements needs to be fully tapped and exploited. There is no need to wait for an extended period to initiate restoration activities; priorities can and should be established in the immediate future and provide interim guidance for appropriations activity while more detailed planning takes place. Consistent with the previous recommendations, immediate action should be taken to adequately support many federal programs that have already been authorized yet inadequately funded.

4. **Science-based decisionmaking should be strengthened by enacting S. 1116, the Great Lakes Water Quality Monitoring Implementation Act**. Recently introduced in response to GAO report recommendations, this legislation can help establish the scientific foundation for restoration plan implementation. It's focus on a consistent and coordinated binational approach is applauded by our membership, which unanimously adopted a resolution at its recent Semiannual Meeting calling for data exchange partnerships and standardization of decision support tools.

5. **The U.S. and Canadian federal governments should be urged to undertake a comprehensive review of the U.S. - Canada *Great Lakes Water Quality Agreement* and revise, if needed, to reflect current restoration priorities**. The GAO report clearly regards the Agreement as a focal point for binational restoration efforts, and also notes that a binational review in 1999 "found that certain provisions were out of date and concluded that certain changes should be considered . . ." Indeed, the current Agreement is now 16 years old. An updated Agreement is fundamental to the success of any prospective restoration plan. The Great Lakes Commission has long been on record in support of Agreement review, and reiterates this need as an important complement to the preceding recommendations.

6. **Plan formulation activity must be prefaced by agreement on a clear and concise definition of "restoration."** Such definitions could conceivably range from a desire to return to pre-settlement ecosystem conditions to justification for exclusively economic objectives. The Great Lakes Commission believes that the term should relate to the restoration of beneficial uses of Basin resources, accommodating ecological and socio-economic needs in an integrated, sustainable manner.

Concluding Remarks

The Great Lakes Commission appreciates the opportunity to submit the above statement and urges subcommittee members to consider our perspectives and recommendations as ecosystem restoration efforts move forward. Questions and comments are welcome and should be directed to Dr. Michael J. Donahue, President/Chief Executive Officer, at Eisenhower Corporate Park, 2805 S. Industrial Hwy, Suite 100, Ann Arbor, Michigan, 48104. Phone 734-971-9135; Fax - 734-971-9150; Email - mdonahue@glc.org.

Attachment

The Great Lakes Program to Ensure Environmental and Economic Prosperity (2003 edition)

The Great Lakes Program to Ensure Environmental and Economic Prosperity

Restore the Greatness!

Great Lakes Commission
des Grands Lacs

Presented to the
108th Congress, first session:
March 2003

Introducing the Great Lakes Program

The *Great Lakes Program to Ensure Environmental and Economic Prosperity* is a descriptive listing of the federal legislative and appropriations priorities of the Great Lakes Commission. Founded in U.S. federal and state law, the Commission has a statutory mandate to represent the collective interests of its member states: **Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania** and **Wisconsin.** The Commission invites the Congress to work in partnership with its member states to promote sound public policy on issues of environmental protection, resource management, transportation and sustainable development.

Great Lakes Commission recommendations target specific programs, authorizations and appropriations. They are based largely on federal programs that have been authorized, yet inadequately funded, as well as important "new start" initiatives. These recommendations provide a blueprint for Great Lakes Commission advocacy efforts during the 108th Congress, and can also provide a foundation for a much needed, long-term Great Lakes Restoration Plan.

Commission priorities for the 108th Congress:

- Cleaning up toxic hot spots
- Shutting the door on invasive species
- Controlling nonpoint source pollution
- Restoring and conserving wetlands and critical coastal habitat
- Ensuring the sustainable use of our water resources
- Strengthening our decision support capability
- Enhancing the commercial and recreational value of our waterways

Provisions of the Great Lakes Program are consistent with, and build upon, the many federal authorities, regional agreements and strategic plans associated with the individual and collective members of the Great Lakes community. Further, the Program recognizes the binational status of the resource and the need to honor U.S. commitments under the U.S.-Canada Great Lakes Water Quality Agreement and associated binational programs.

Our Vision: *We seek a Great Lakes region that offers a prosperous economy, a healthy environment and a high quality of life for all citizens by applying sustainable development principles in the use, management and protection of our water, land and other natural resources.*

Let's give the Great Lakes their due

The Great Lakes of North America are the lifeblood of a great region, and the key to the environmental and economic prosperity of tens of millions of residents. Simply put, they are a national and international treasure, and *they deserve to be treated as such!*

Sadly, a legacy of misuse and abuse has compromised the "greatness" of the Great Lakes. Chemical and biological contaminants have limited our ability to eat the fish we catch, prevented us from swimming at our public beaches, made us vulnerable to health problems, and threatened the diversity of our fish and wildlife resources. Improper land-use practices have also affected the ecological, economic and social health of our region. And, an aging infrastructure for water-based transportation has limited the potential of North America's industrial heartland.

Thank you!

Since the first iteration of the Great Lakes Program was released two years ago, many of its recommendations have been embraced by the Congress. We thank the Great Lakes Congressional Delegation, along with Commission members and partners, for advancing Program goals and priority actions.
Let's build upon that success during the 108th Congress!

To be sure, progress has been made since the 1960s and 70s when the lakes were declared "dead or dying." But progress has been too slow, and the steady erosion of federal support threatens to compromise past progress and limit future opportunities. The "band-aid" approach to address problems has been an injustice to this world-class resource. Indeed, this is no way to treat a national and international treasure!

Toward a Great Lakes Restoration Plan

The *Great Lakes Program to Ensure Environmental and Economic Prosperity* is an important step toward the development of a large scale, long-term Great Lakes Restoration Plan. Such a consensus-based plan will yield a detailed blueprint of unprecedented scope that will guide state/federal/stakeholder partnerships years into the future. Toward this end, the Great Lakes Commission calls for a multi-year federal appropriation to provide for Great Lakes Restoration Plan development under the leadership of the Council of Great Lakes Governors with input from the larger Great Lakes community. *(See page 7)*

The Great Lakes Program to Ensure Environmental and Economic Prosperity is an important step toward the development of a large scale, long-term **Great Lakes Restoration Plan.**

An invitation

The Great Lakes Commission, acting on behalf of its eight member states, invites the Congress and the Great Lakes community to: **embrace** the vision and goals of *The Great Lakes Program to Ensure Environmental and Economic Prosperity*, **consider** its "selected priority actions" as legislative and appropriations initiatives are developed and pursued, and **work together**, over time, to develop a large scale, consensus-based restoration plan that will *Restore the Greatness* to this tremendous resource.

We welcome the opportunity to work with the Congress, and all our partners, to achieve our **shared vision.**

The Great Lakes Program is a work in progress; it will evolve over time. We recognize that the Program's vision cannot be attained through enhanced federal funding alone. It requires strategically targeted and efficiently managed programs, strong intergovernmental partnerships, stakeholder support and involvement, unity of purpose, and a willingness to move beyond the status quo to act in bold and creative ways. We welcome the opportunity to work with the Congress, and all our partners, to achieve our shared vision.

Our Priorities

Cleaning up toxic hot spots

Goal

Restore and maintain beneficial uses in each of the 31 U.S. and binational Areas of Concern, with a special emphasis on remediation of contaminated sediment.

Benefits

Contaminated sediments are a persistent source of toxic pollution to the Great Lakes at every one of the 31 U.S. and binational Areas of Concern (AOCs). They are at least partially responsible for 11 of the 14 beneficial use impairments identified in the U.S.-Canada Great Lakes Water Quality Agreement, including fish consumption advisories, fish tumors and deformities, and restrictions on dredging activities. The remediation of contaminated sediment through environmental dredging and the application of other technologies is a key step toward restoration of beneficial uses and delisting of AOCs. Also important are prevention programs to keep sites off the AOC list.

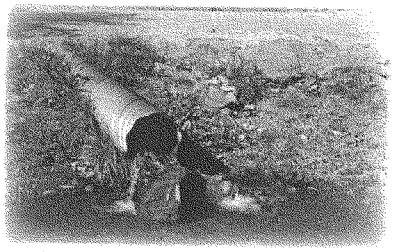
The **remediation of contaminated sediments** through environmental dredging and the application of other technologies is a key step toward restoration of beneficial uses and delisting of **Areas of Concern.**

Selected priority actions

- **Cleaning up U.S. and binational Areas of Concern:** Fully fund the Great Lakes Legacy Act of 2002 to restore beneficial uses at 31 U.S. and binational toxic "hot spots" – $54.0 million in FY2004 and through FY2008 to the Great Lakes National Program Office (GLNPO), U.S. Environmental Protection Agency (USEPA).
- **Environmental dredging:** Provide cost-shared support to Great Lakes states (including acceptance of in-kind

services and funds from nonfederal entities) for AOC cleanup under Section 312 of the Water Resources Development Act (WRDA) of 1990 – $5.0 million in FY2004 to the U.S. Army Corps of Engineers (Corps of Engineers), increasing to $50.0 million in FY2006.

- **Remedial Action Plan support:** Develop and demonstrate promising sediment remediation technologies, with a focus on beneficial re-use of dredged materials, under Section 401 of WRDA 1990 – $4.0 million in FY2004 to the Corps of Engineers in cooperation with USEPA, increasing to $7.0 million in FY2006.



- **Natural Resource Damage Assessments:** Ensure that polluters responsible for sediment contamination pay their fair share – $5.0 million annually to the U.S. Fish and Wildlife Service (USFWS) for Great Lakes projects.
- **Restoration of coastal environmental management funding:** Accelerate implementation of Remedial Action Plans, Lakewide Management Plans and related Great Lakes activities – $15.0 million annually to USEPA.

Shutting the door on invasive species

Goal

Restore and protect the ecological and economic health of the Great Lakes by preventing the introduction of new invasive species and limiting the spread of established ones.

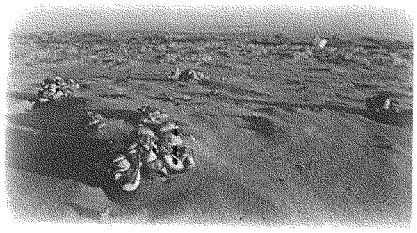
Benefits

Invasive species are a growing and potentially devastating threat to the economy and environment of the Great Lakes region. Costs to date are documented in the hundreds of millions of dollars, and are estimated to be as high as $5.0 billion over a 10-year period if measures to address the problem are not taken. Invasive species are insidious forms of biological pollution that prey upon and displace native animals and plants, reduce biodiversity, limit water use activities, and damage infrastructure. Preventing new infestations and limiting the spread of established ones will help restore and protect the environment and associated water-dependent economic activity.

Invasive species are a growing and potentially devastating threat to the economy and environment of the Great Lakes region.

Selected priority actions

- **Pass the National Aquatic Invasive Species Act (NAISA):** Reauthorize and amend the National Invasive Species Act (NISA) to strengthen national, regional and state programs, and develop ballast management standards and regulations consistent with recommendations of the Great Lakes Commission and the Great Lakes Panel on Aquatic Nuisance Species.
- **Comprehensive state management plans (NISA, Sec. 1204):** Support federal/state partnerships on critically important prevention and control programs – $4.0 million annually to USFWS, with an equitable share for Great Lakes state programs.
- **Great Lakes Panel on Aquatic Nuisance Species [NISA, Sec. 1203(a)]:** Ensure effective, efficient and well-coordinated regional prevention and control programs – $0.3 million annually to USFWS, with $0.1 million to the Great Lakes Commission for Panel operations.



- **Ballast technology development and demonstrations:** Address a leading vector for invasive species (commercial vessels in ballast or "no ballast on board" status) –
  - **Ballast Water Management Demonstration Program (NISA, Sec. 1104):** $2.5 million to National Oceanic and Atmospheric Administration (NOAA);
  - **Aquatic Nuisance Species Program [NISA, Sec. 1202(f)]:** $2.8 million to the National Sea Grant Program (under section 205 of the National Sea Grant College Program Act), with an equitable share for the Great Lakes Sea Grant Program;

- Ballast Water Management Demonstration Program (NISA, Sec. 1104): $2.5 million to the Great Lakes Science Center, U.S. Geological Survey (USGS);
- ANS in U.S. waters - Ballast Water Program and Ballast Water Information Clearinghouse (NISA, Sec. 1101): $3.0 million to the U.S. Coast Guard (USCG), with no less than $1.5 million to Great Lakes states.

- Zebra Mussel Demonstration Program [NISA, Sec. 1202(i)]: Develop a national center for research on invasive species – $1.625 million to the NOAA Great Lakes Environmental Research Laboratory (GLERL).
- Dispersal barrier demonstration [NISA, sec. 1202(i)]: Construct, maintain and evaluate the dispersal barrier in the Chicago Sanitary and Ship Canal, and undertake related control activities – $0.5 million annually to the Corps of Engineers.
- Sea lamprey barriers [WRDA 1986, Sec. 1135(c) as amended]: Prevent and control the spread of Asian Carp and sea lamprey and construct a second dispersal barrier in the Chicago Sanitary and Ship Canal – $25.0 million to the Corps of Engineers nationally, with $8.0 million of this total to the Great Lakes ($5.0 million for the barrier and $3.0 million for sea lamprey control).
- Best available technology on commercial vessels: Authorize and fund a program to retrofit commercial vessels to eliminate/reduce infestations and spread – $25.0 million annually to the USCG.

Controlling nonpoint source pollution

Goal

Improve Great Lakes water quality and economic productivity by controlling nonpoint source pollution from water, land and air pathways.

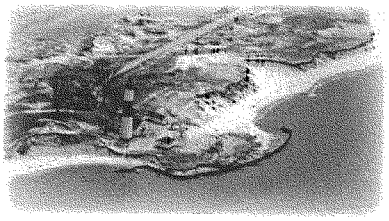
Benefits

Responsible use of our water, land and air resources is vitally important to the environmental quality and economic productivity of the Great Lakes region. Yet, nonpoint sources are the leading pollution pathway to the Great Lakes, and include urban and agricultural runoff and air deposition. Hundreds of millions of tons of topsoil erode into the lakes each year and millions of tons of airborne contaminants are deposited as well. Irresponsible resource-use practices are particularly damaging because they simultaneously degrade the environment and compromise the economic use and value of the resource.

Irresponsible resource-use practices are particularly damaging because they simultaneously degrade the environment and compromise the economic use and value of the resource.

Selected priority actions

- Great Lakes Basin Program for Soil Erosion and Sediment Control: Measurably improve water quality and land use through local projects – $5.0 million annually to the Great Lakes Commission through the Natural Resources Conservation Service-U.S. Department of Agriculture (NRCS-USDA) for competitive grants to the Great Lakes states for demonstration and technical assistance projects.
- Section 319 of the Clean Water Act: Address nonpoint source pollution problems in the Great Lakes basin and nationally – $250.0 million annually to USEPA nationally, with an equitable share for the Great Lakes states.
- Great Waters Program: Inventory, research and monitor airborne toxic contaminants and assess their contribution to water quality problems – $3.0 million annually to the Great Waters Program (Clean Air Act) within USEPA, with no less than $1.5 million directed to the Great Lakes region.
- Great Lakes Sediment Management Program: Reduce nonpoint source pollution by developing and applying sediment transport models to priority tributaries under Section 516(c) of WRDA 1996 – $2.0 million annually to the Corps of Engineers.
- Conservation Reserve Program and Conservation Reserve Enhancement Program: Take highly erodible land out of agricultural production, apply Best Management Practices, and assist states in targeting priority areas – enhanced funding to USDA, with an equitable share for the Great Lakes region.
- Farmland Protection Program: Provide funding for conservation easements whereby farmers voluntarily convey development rights to local authorities or land trusts – at least $125.0 million annually to USDA, with an equitable share for the Great Lakes region.



- **Great Lakes beach health:** Ensure public safety by reducing contaminants, improving monitoring, enhancing public notification efforts, undertaking research on indicators, and developing rapid sampling technologies – $30.0 million annually to USEPA under the Beaches Environmental Assessment and Coastal Health Act of 2000, with an equitable share for the Great Lakes region.

Restoring and conserving wetlands and critical coastal habitat

Goal

Restore 100,000 acres of wetlands and critical coastal habitat while protecting existing, high quality fish and wildlife habitat in the Great Lakes basin.

Benefits

Wetlands and coastal marshes provide critical habitat for fish and wildlife, help store and cycle nutrients, prevent erosion of soil and shorelines, and provide a tremendous recreational value to the region. Their loss is progressive; only 300,000 acres of coastal wetlands remain in the basin. Similarly, the loss of small streams and associated floodplains due to urbanization impairs critical habitat and compromises ecological and economic benefits.

Wetlands and coastal marshes provide critical habitat for fish and wildlife, help store and cycle nutrients, prevent erosion of soil and shorelines, and provide a tremendous recreational value to the region.

Selected priority actions

- **Reauthorization of the Coastal Zone Management Act:** Strengthen programs that conserve coastal resources; manage population growth; advance coastal nonpoint pollution control initiatives; and develop indicators and monitoring programs to measure progress – $90.0 million annually to NOAA with no less than $15.0 million for Great Lakes programs.
- **Great Lakes Fish and Wildlife Restoration Act:** Enhance cost-shared grants to states and tribes for fish and wildlife restoration with acceptance of both in-kind services and funds from nonfederal entities, and operational support of USFWS – $8.0 million annually to USFWS.
- **Restoration of Great Lakes coastal resources:** Cost-shared grants and technical assistance for locally led coastal projects that benefit fish and wildlife species and associated habitats – $20.0 million annually to USFWS nationally, with no less than $5.0 million for Great Lakes programs.
- **Great Lakes Fishery and Ecosystem Restoration Program:**
  - Restore critical aquatic habitat through projects under Section 506 of WRDA 2000 – $1.0 million in FY2004 increasing (in equal increments) to $10.0 million in FY2007 to the Corps of Engineers, in consultation with the Great Lakes Fishery Commission.
  - Allow in-kind contributions for the nonfederal share for planning, design and construction, and eliminate cost-share requirement for post-construction monitoring and evaluation by amending subsection 506(f).

- **Wetlands Reserve Program:** Purchase long-term easements that return agricultural lands to wetlands essential for Great Lakes hydrology and critical habitat – $35.0 million annually to NRCS-USDA for Great Lakes programs.
- **North American Wetlands Conservation Act:** Stimulate public/private partnerships to protect, restore and manage wetland habitat – $45.0 million annually to USFWS, with an equitable share for the Great Lakes region.
- **Conservation and Reinvestment Act:** Reinvest in coastal resources through restoration projects that include contaminated site cleanup, stormwater controls, wetland restoration, buffer/greenway acquisition, and related pollution control and coastal restoration activities – $30.0 million annually to NOAA for the Great Lakes states.

Ensuring the sustainable use of our water resources

Goal

Ensure the sustainable use and management of Great Lakes water resources to protect environmental quality and provide for water-based economic activity in the Great Lakes states.

Benefits

Continuing reductions in federally funded monitoring, data gathering and analysis programs have severely compromised our ability to assess the status of our water

resources, track trends in usage, and develop regionwide programs to sustainably manage use and withdrawals. Lacking these capabilities leaves the world's greatest freshwater resource, and the economy that depends upon it, in a highly vulnerable state. The federal government, in partnership with the Great Lakes states, must ensure regional prosperity through programs that strengthen our ability to manage water resources for environmentally sound, sustainable use. Enhanced federal support will complement state and provincial efforts under Annex 2001 of the Great Lakes Charter of 1985.

The federal government, in partnership with the Great Lakes states, must **ensure regional prosperity** through programs that strengthen our ability to manage water resources for environmentally sound, sustainable use.

Selected priority actions

- **Water Use Management Program:**
  - Authorize a federal/state partnership and state grants program for forecasting, monitoring, mapping and trend analysis of water withdrawal and use consistent with Annex 2001 of the 1985 Great Lakes Charter – $5.0 million annually to the Corps of Engineers.
  - Implement recommendations of the Great Lakes Biohydrological Information Study conducted under the John Glenn Great Lakes Basin Program, Section 455(b) of WRDA 1999 – $2.0 million in FY2004 to the Corps of Engineers.
  - Research, assess and refine hydrologic accounting of the Great Lakes water balance and provide critical water data in a timely manner for decisionmaking to support Annex 2001 implementation – annual apropriations of $3.75 million to USGS, $1.4 million to NOAA, and $0.4 million to the Corps of Engineers.
- **Great Lakes Water Level Observation Network:** Maintain and upgrade 51 lake level gauges/monitoring stations that serve commercial vessel operators, resource managers and scientists with real-time data – $2.0 million annually to NOAA and authorizing language in the Hydrographic Services Improvement Act.
- **Coastal remote sensing program:** Study coastal habitat change using Great Lakes Coastal Wetlands Consortium protocols - $5.0 million annually for five years to the Corps of Engineers, in cooperation with the USFWS and USEPA-GLNPO, through amendment of the John Glenn Great Lakes Basin Program.
- **Tributary and groundwater monitoring programs:**
  - **USEPA Clean Water Program:** Improve federal/state coordination of surface water monitoring programs under Section 106 of the Clean Water Act and generate compatible tributary data across lake basins - $195 million nationally to USEPA, with no less than $44 million for the Great Lakes states.
  - **USGS National Water Quality Assessment Program:** Surface and ground water monitoring to establish trend data in Great Lakes study units (Western Lake Michigan and Lake Erie-Lake St. Clair Drainages) - $2 million annually to USGS.
  - Enhance understanding of groundwater flow to the Great Lakes and estimate influence of flow on Lake Erie coastal marshes – $0.25 million annually to USGS.

Strengthening our decision support capability

Goal

Meet domestic and international Great Lakes commitments through adequate funding for, and the efficient and targeted operation of, federally funded management and research agencies.

Benefits

A number of international and domestic agreements and plans have been formulated to safeguard the sustainable use of our water and related land and air resources. In the United States, they are implemented through a variety of federal research and management agencies. The last decade has seen a declining capability to manage the world's greatest freshwater resource, forcing federal and state stewards to work in a "crisis management" mode. Strengthening our decision support capability will ensure that federal laws, policies and programs, as well as

Benefits will accrue to the environment and economy, including **numerous multibillion dollar-a-year industries** in the region, such as sport fishing, recreational boating and water-based tourism.

international commitments, are carried out efficiently and effectively. Benefits will accrue to the environment and economy, including numerous multibillion dollar-a-year industries in the region, such as sport fishing, recreational boating and water-based tourism. The Great Lakes Commission recognizes that the federally funded Great Lakes research community must be fully responsive to the resource management and related public policy priorities of its member states.

Selected priority actions

- **Great Lakes Restoration Plan development:** Develop, via state/federal partnership, a restoration plan for the Great Lakes ecosystem reflecting priorities identified by the Council of Great Lakes Governors and based upon regionwide consensus – $2.0 million annually from FY2004 through FY 2006, followed by appropriations for implementation. Funding for the Great Lakes states, Great Lakes Commission and Council of Great Lakes Governors through appropriate federal agency(ies).
- **Co-location of public Great Lakes research and policy institutions:** To house multiple institutions presently located in separate facilities in Ann Arbor, Mich., enhance collaboration and efficiency, and significantly reduce operating costs – $3.0 million in FY2004 through NOAA for planning, design and site development followed by a construction request.
- **Federally funded research, planning and management agencies:**
  - **NOAA/Great Lakes Environmental Research Laboratory:** Provide scientific expertise for decisions on lake levels and flows, ice cover and coastal processes – $15.0 million annually.
  - **USGS/Great Lakes Science Center:** Provide critical information for sound management of fish populations, coastal habitat and other natural resources – $15.0 million annually.
  - **USEPA/Great Lakes National Program Office and research facilities:** Improve the environmental health and economic vitality of the resource through Remedial Action Plan and Lakewide Management Plan initiatives, among others – $25.0 million annually to GLNPO (Chicago, Ill.) and $18.0 million annually to USEPA research facilities in Duluth, Minn. and Grosse Ile, Mich.
- **International commissions:**
  - **Great Lakes Fishery Commission:** Protect a multibillion dollar binational sport fishery by controlling the sea lamprey and other invasive species, and managing a sustainable, economically productive fishery – $15.0 million annually.
  - **International Joint Commission:** Fulfill treaty and reference obligations with Canada in restoring Great Lakes basin ecosystem integrity – $10.0 million annually.
- **Great Lakes Water Resources Strategic Plan:** Complete and implement a strategic plan under the John Glenn Great Lakes Basin Program, (Section 455(a) of WRDA 1999) that directs Corps of Engineers' environmental and economic priorities – $0.1 million in FY2004 to the Corps of Engineers.
- **National Sea Grant College Program:** Promote and support scientific research and outreach programs on topics ranging from aquatic nuisance species to sustainable coastal development – $100.0 million annually, with an equitable share for Great Lakes state programs.

Enhancing the commercial and recreational value of our waterways

Goal

Maximize the commercial and recreational value of Great Lakes waterways and other coastal areas by maintaining and constructing critical infrastructure and implementing programs for sustainable use.

Benefits

Great Lakes waterborne transportation is the foundation on which the U.S. and Canadian regional and national manufacturing economies were built, with annual commerce averaging about 180 million tons in recent years. The Great Lakes navigation system includes 68 deep-draft harbors, 71 shallow-draft harbors, 734 miles of navigation channel, 150 miles of breakwater and 26 lock chambers. Studies show that waterborne transportation on the Great Lakes is preferable to rail and over-the-road options from pollutant emissions, fuel efficiency and safety standpoints. However, the bulk of Great Lakes navigation infrastructure was constructed between 50 and 100 years ago, and has not had major rehabilitation or modernization.

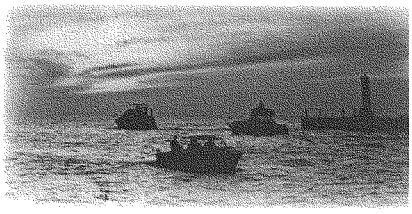
Learn more about the Great Lakes Commission @ http://www.glc.org/

Similarly, our waterways and other coastal areas offer tremendous recreational opportunities and associated economic benefits. Recreational boating, for example, is a multibillion dollar-a-year industry, and the Great Lakes states are home to one of every three registered boats in the United States. Also, the Great Lakes Circle Tour, a 6,500-mile designated scenic roadway established by the Great Lakes Commission, showcases our world-class binational resources and provides access to the water-based recreational opportunities available within our communities and along our shoreline. The viability of these and other water-based recreational activities and facilities is also highly dependent on federal/state partnerships.

Studies show that waterborne transportation on the Great Lakes is preferable to rail and over-the-road options from pollutant emissions, fuel efficiency and safety standpoints.

Selected priority actions

- **Replacement lock at Sault Ste. Marie:** Ensure the safety and reliability of waterborne transportation – $5.0 million in FY2004 to the Corps of Engineers toward a total estimated federal cost of $172.0 million.
- **Maintenance and repairs to Great Lakes harbors and channels:** Ensure safe navigation by eliminating a project backlog and addressing expected low water conditions – $20.0 million annually to the Corps of Engineers.
- **Recreational navigation projects:** Complete the recreational boating economic benefits study authorized by the John Glenn Great Lakes Basin Program (Section 455(c) of WRDA 1999) – $0.275 million to the Corps of Engineers; and, to amend Section 455(f) to allow use of in-kind services to satisfy nonfederal cost-share requirements.
- **Great Lakes navigation system:** Continue the study (Section 456 of WRDA 1999) of potential capital improvements to optimize navigation system infrastructure – $2.0 million in FY2004 to the Corps of Engineers.
- **Vessel safety:** Promote safe navigation and support commercial and recreational vessel operators through the Great Lakes component of the USCG's Rescue 21 initiative, the primary system for command, control and communications – $134.0 million in FY2004 to USCG nationally, with an equitable share for the Great Lakes region.
- **Waterfront restoration and remediation:** Rehabilitate waterfront and nearby brownfields – expand Corps of Engineers' construction authority through WRDA legislation.
- **Beneficial use of dredged material:** Expand (beyond aquatic habitat) the types of beneficial uses for dredged material removed from federal navigation projects – amend Section 204 of WRDA 1992.



- **Maritime homeland security:** Enhance USCG security capability at Great Lakes small boat stations and marine safety offices while sustaining search and rescue and marine safety capabilities – $34.0 million in FY2004 nationally, with an equitable share for the Great Lakes region.

All photos courtesy Dave Brenner, Michigan Sea Grant. Satellite image (cover) courtesy U.S. Army Corps of Engineers, Detroit District.

Great Lakes Commission
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Testimony of David Dempsey
Policy Advisor, Michigan Environmental Council
Lansing, Michigan
July 16, 2003

Public Participation, Institutional Reform As Key Components of Great Lakes Restoration Management

Hearing of the Subcommittee on Oversight of Government Management, Committee on Governmental Affairs, United States Senate

Thank you for the opportunity to provide this testimony on an important element of any Congressional commitment to Great Lakes restoration, the reform of regional Great Lakes institutions and the renewal of opportunities for citizens of the Great Lakes Basin to speak and be heard on ecosystem health and government policies. We believe that no Congressional initiative addressing the Lakes will be successful unless it considers the lessons of recent environmental history and invites the public to be a full participant in decision-making.

In his book *Cleaning Up the Great Lakes*, environmental historian Terence Kehoe observes that as Great Lakes pollution peaked in the 1950s and 1960s, federal and state governments pursued a policy of "cooperative pragmatism." Government pollution control officials and representatives of industrial and municipal polluters worked as partners, sometimes behind closed doors, to hammer out agreements on how much waste they could dump into Great Lakes waters. While this may have served the interests of the dischargers, it nearly ruined the ecosystem. The Great Lakes absorbed more pollution, especially nutrients, than they could tolerate, leading to algae-choked waters and the decline of fisheries.

Understandably, the public was outraged, and clamored for reform. Across the Great Lakes Basin, individual citizens and groups of citizens insisted on immediate cleanup and pressured government officials to protect the Lakes. Between the late 1960s and the early 1970s, Kehoe records, "cooperative pragmatism" collapsed like a house of cards. The U.S. Environmental Protection Agency, Congress, and the states enacted tough pollution laws and standards, set ambitious goals for restoring waters, and – critically – mandated that the public's views be solicited and considered in decisions on policies and permits. We can trace the beginning of Great Lakes recovery to this period and these reforms.

In recent years, as the Great Lakes ecosystem has begun to suffer from a complex assortment of new problems, governments have often retreated to the practices of "cooperative pragmatism" that characterized the period of ecosystem decline. Federal agencies have attempted to bypass the public forum provided by the biennial water quality meetings of the International Joint Commission (IJC). The IJC itself has reduced both the avenues and amount of time provided for public participation in comment on

Great Lakes water quality issues. Some of the Great Lakes Basin states have eliminated or inhibited the freedom of citizen commissions that formerly made public decisions about water pollution policies and permits. And most states have embraced the idea that government/industry partnerships are a superior to strict standards and enforcement as a means of promoting environmental health.

As a result, it can be argued not only that the problems of the Great Lakes have worsened, but also that governments with responsibility for pieces of the Great Lakes puzzle have lost touch with the strong public support for Great Lakes protection. Governments that do not invite citizens to participate in environmental decision-making are, almost by definition, unable to hear the voice of the public. This is a defect that must be cured if Congressional and state action to restore the health of the Great Lakes ecosystem is to succeed.

We agree with the conclusions of the April 2003 U.S. General Accounting Office Report, *Great Lakes: An Overall Strategy and Indicators for Measuring Progress are Needed to Better Achieve Restoration Goals.* There is clearly a need for an "overarching plan for coordinating and tying together the strategies and program activities into a coherent approach to attain overall basin restoration." We contend that such a plan must not only accept, but also build into its core a strong public reporting and public participation component.

Therefore, we respectfully suggest that the Congress take steps as part of a Great Lakes restoration initiative to strengthen public participation opportunities in state, federal and international environmental institutions and to make it clear that the public which enjoys and benefits from the lakes for drinking water, fishing, swimming, boating, and other uses is a full partner in the restoration effort. The following are our specific proposals.

1. Include a strong public participation component in Congressional Great Lakes restoration legislation. We are heartened by indications that this legislation will include a board to advise federal officials and to provide oversight of the proposed substantial new federal funding for Great Lakes programs. However, it is important that the initiative go beyond conventional public participation opportunities in three ways:

- **The advisory board should include significant representation of citizens at large.** Any federal advisory board overseeing the spending of billions of dollars of taxpayer money on the Great Lakes should have significant representation of citizens not affiliated with government, business or scientific institutions that may seek funding or otherwise be compromised in their ability to provide candid advice on the initiative. Further, a strong public voice in the advisory board would assure that public concerns are a significant factor in the shaping of the restoration initiative.

- **The advisory board should have clear direction, and an explicit mandate, to evaluate and report to the public on the initiative as it is undertaken.** The role of the board should not be limited merely to generalized advice. The board should be directed to issue periodic reports to the public on spending decisions and on the progress of the restoration initiative.

- **States seeking federal funding through the legislation should be required to demonstrate they have sought and benefited from public participation in the development of state funding proposals or Great Lakes plans.** Basic eligibility for federal grant funds under the initiative should be conditioned on a demonstration by each state that it has sought and benefited from public participation in preparing its request for funds. The demonstration should include not simply a conventional public comment opportunity within each state, but also the establishment of broad-based public advisory boards to assist the state in preparing plans and proposals for federal funding.

2. Reform of the U.S. appointment process to the International Joint Commission. In 1995, the Environmental Law Institute (ELI) reviewed the role of the IJC in spurring Great Lakes cleanup and made several recommendations to strengthen the role of the Commission and the interested public. Congress should consider amending the Treaty implementing legislation and urge the U.S. State Department to change the process by which the IJC undertakes studies of issues in the following ways:

- **Congress should establish a fixed number of years for the terms of IJC Commissioners, and should stagger the dates of their appointments to prevent wholesale turnover of Commissioners.** As ELI observes, an earlier tradition of appointments that spanned changes in power in the U.S. and Canadian federal governments gave way in the U.S. in 1980 to the use of the IJC as a source of presidential patronage. Three new U.S. commissioners were appointed, for example, in 1994-1995 and again in 2002. Direct Presidential control of IJC appointments compromises the independence and effectiveness of the institution. By contrast, U.S. members of the Great Lakes Fishery Commission (except the alternate member) serve fixed six-year terms and, in practice, tend to exercise more independence in judgment. Although turnover of IJC members from Canada has not been as complete, Canadian commissioners are also political appointees and longevity and independence of service are no longer characteristic among the Canadian IJC delegation as well.

- **The U.S. and Canadian federal governments should authorize the IJC to accept and review public petitions for IJC action on boundary water issues.** The inability of the IJC either to initiate its own investigations of Great Lakes ecosystem issues, or to receive and act on citizen petitions to do the same, severely limits its effectiveness as an independent monitor of the lakes. A consensus of the two parties to the Boundary Waters Treaty, sometimes taking a year or more to achieve, is needed before the IJC can receive a reference and begin an investigation. In effect, the IJC

cannot review any boundary waters issue that either government fears would prove unduly embarrassing to its reputation. ELI observed that while an amendment to the Treaty itself was probably politically unrealistic, the two nations could act on this recommendation by creating an effective public petition process through use of the reference power under Article IX of the Treaty, in a fashion similar to that done in creating the Great Lakes Water Quality Agreement itself.

3. Congress should assure improved environmental monitoring and reporting to the public on Great Lakes ecosystem health.

The recent U.S. General Accounting Office report on Great Lakes programs strongly suggested that environmental monitoring of the Lakes has been reduced and is a patchwork that fails to tell a meaningful story about ecosystem health to the public. As just one example, the decision of governments in the 1990s to discontinue collection of data on phosphorus loadings to Lake Erie has undermined their ability to pinpoint the causes of the Lake's recent problems. This should make it emphatically clear that Congress needs to spell out in statute a requirement that important environmental indicators are identified and data continuously collected to determine the status of the indicators. It is all too tempting for governments otherwise to declare a pollution or habitat problem "solved," reduce or eliminate funding to monitor it, and move on to something else.

The recent introduction of S. 1116, the Great Lakes Water Quality Indicators and Monitoring Act, and of H.R. 2668, the Great Lakes Controlled Data Collection and Monitoring Act, are encouraging signs of a strong Congressional response to the GAO findings. Both would improve the collection and reporting of critical Great Lakes data. We respectfully suggest that both bills could be improved by establishing an advisory committee with strong representation of the general public to assist in identifying indicators of relevance to that public and to oversee reporting to assure that it is done objectively and that information is communicated understandably to the public.

4. Congress should not consent to an interstate compact on Great Lakes water exports and consumptive uses unless it contains adequate safeguards for public accountability and participation.

Pursuant to the interstate agreement known as Annex 2001, the Great Lakes states are considering the development of a compact to formalize decision-making on major water export and consumptive use proposals affecting the Great Lakes. If such a compact is ultimately presented to the Congress for ratification, we strongly urge that it be examined to assure the public has opportunities to participate in these ecosystem decisions. Specifically, such a compact should assure members of the public are appointed to the compact commission, that decisions on proposed uses be made only after extensive public comment opportunities, and that the commission undertakes public outreach on the issues within its scope of authority.

To summarize, no Great Lakes restoration proposal can achieve significant success without recognizing that the critical role of the public in supporting restoration. When governments have respected and encouraged public views, the Lakes have rebounded. At this critical time, Congress can do much to assure the future of the Lakes by enacting laws that solicit active participation by the public in decision-making and by funding comprehensive environmental monitoring and meaningful reporting to the public on what the monitoring indicates.

Thank you again for the opportunity to comment.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

RECEIVED

AUG 2 2 2003

Honorable George V. Voinovich
Chairman, Subcommittee on Oversight of
Government Management, the Federal
Workforce, and the District of Columbia
Committee on Government Affairs
United State Senate
Washington, D.C. 20510

Dear Mr. Chairman:

Thank you for your fax of July 25, 2003, requesting a response to a factual question regarding the recent hearing on Great Lakes restoration and the Joint Strategic Plan for Management of Great Lakes Fisheries. Please find enclosed the response of the U.S. Fish and Wildlife Service.

I look forward to working with the Committee again in the future. If you have any questions, please do not hesitate to contact me at (612)713-5301.

Sincerely,

Acting Director
DIRECTOR

Enclosure

Question for Region 3 Director

You stated in your testimony that the U.S. Fish and Wildlife Service is a signatory to the Joint Strategic Plan for Management of Great lakes Fisheries. Please describe in greater detail this Plan, the work that is being done, and the Service's involvement.

The Joint Strategic Plan for Management of Great Lakes Fisheries (Plan) was signed in 1981 by agencies with fishery management authority and interests in the Great Lakes, to facilitate cooperative fishery management and restoration activities. Committees organized and facilitated by the Great Lakes Fishery Commission implement the Plan. Each of the Great Lakes has its own Lake Committee, and a Council of Lake Committees, comprised of representatives from each Lake Committee, addresses basin-wide fisheries management issues.

The Plan and its organization are similar to Regional Fishery Management Councils created under the Fishery Conservation and Management Act of 1976. A key difference is that the Great Lakes organization includes Canadian and U. S. agencies, states, provinces, tribes and treaty authorities. Other unique aspects of the Plan are that it was voluntarily created and signed by the agencies and it goes far beyond coordinated regulation of fisheries to include fisheries research, management and restoration in a fully coordinated approach. Accomplishments of the Plan include all aspects of coordinated fisheries research, management, fish health, habitat rehabilitation and law enforcement. The Plan and its organizational structure have been linked to activities authorized under the Great Lakes Fish and Wildlife Restoration Act of 1998, through which millions of dollars of fish and wildlife restoration activities have been implemented.

The U.S. Fish and Wildlife Service plays a central role in several aspects of fisheries management under the Plan. Some of our most important responsibilities include coordinating with partners to implement the Great Lakes Fish and Wildlife Restoration Act, providing 3.8 million lake trout annually from National Fish Hatcheries for interagency restoration programs, providing fish health diagnostic services, implementing fish passage and aquatic habitat rehabilitation projects, surveillance and control of invasive aquatic species such as ruffe, round goby and Asian carp, and serving as U.S. agent for the sea lamprey control program.

Question for Mr. Thomas Skinner
Environmental Protection Agency Region V Administrator

Question:

The GAO report states that* "Although federal and state officials recently developed and published a report, (EPA's) Great Lakes Strategy 2002... the document, largely a description of existing and planned program activities, did not provide a basis or mechanisms to prioritize or make funding commitments to implement the various activities." *Please respond to this statement.

Answer:

The Great Lakes Strategy (hereafter "The Strategy") is significantly more than a description of existing and planned program activities. The Strategy is the result of a three-year effort to prioritize the actions of the governmental agencies responsible for the protection and restoration of the Great Lakes. It was created by the U.S. Policy Committee, a forum of senior-level representatives from ten Federal agencies, the eight Great Lakes States, and Tribal partners the Federal, State, and Tribal agencies. EPA's Great Lakes National Program Office facilitated the development of the Strategy as part of its coordination responsibilities described in Section 118 of the Clean Water Act.

The initial phase of the development of the Strategy included an inventory of the governmental partners' existing and planned program activities. Building from this foundation, over 90 agency staff members participated in technical working groups to identify the most important actions to advance protection and restoration efforts. To ensure accountability, senior-level staff also developed measurable, overarching goals to track progress towards implementing priority actions. The Strategy identifies the most important efforts needed to protect and restore the Great Lakes, and it establishes a system for tracking progress toward meeting these priorities.

Further, with respect to the issue of priorities, the Strategy development process can also be viewed as a priority setting process. The development of the Strategy occurred over several years and discussions were held to determine what the most significant problems were for the Great Lakes, and what could be done by the Agencies to address them. The goals and measures in the Strategy thus can be viewed as a collection of the Agencies' highest priorities for the Great Lakes. The Strategy identifies the most important efforts needed to protect and restore the Great Lakes, and the USPC is tracking progress toward meeting the priorities outlined in the Strategy.

With respect to funding, the uncertainty of funding commitments over the long term was a significant issue during the development of the Strategy. The Strategy is a statement of what we can reasonably try to achieve with existing resources, while recognizing there is a great degree of uncertainty involved with budget levels of the Agencies, including State agencies. As stated in the Strategy:

> "The near-term goals, objectives, and actions are intended to be ambitious but achievable given current funding, resources, and regulatory requirements. Recognizing that governmental agencies' budgets are appropriated annually or biennially, successful implementation will depend, in part, on continued adequate funding and resources and ongoing implementation and enforcement of current regulatory requirements."

In conclusion, the Strategy is a statement of what we can reasonably try to achieve by prioritizing existing resources, while recognizing there is a significant degree of uncertainty involved in predicting out-year resource levels. There are significant challenges involved in protecting and restoring a system as large and dynamic as the Great Lakes on many levels, and the Strategy recognizes this. In addition to serving as a very important instrument for priority work and achieving goals through cooperation among the public and private sectors on the U.S. side of the border, Great Lakes Strategy 2002 is also a very important US framework for United States partnering with Canada, through EPA's co-leadership with Environment Canada, to effectively work toward and achieve important requirements and goals of the US-Canada Great Lakes Water Quality Agreement.

RESPONSES TO QUESTIONS FOR COL. RYAN

Q1. What has the Corps learned about large watershed studies from the Everglades and similar projects that might be helpful as we move forward in developing a comprehensive restoration plan for the Great Lakes?

A1. What the Corps has learned from the Everglades and similar studies, such as Coastal Louisiana, is that development of a comprehensive restoration plan needs to address water challenges from a watershed view, emphasizing collaboration and integration among all stakeholders to ensure both environmental and economic prosperity. Since the primacy for water resources management resides at the State and local level, we found that the role of the Federal government was to facilitate State and local leadership; to coordinate State, local and stakeholder involvement; and to work with State and local interests to develop a framework for partnership and collaboration. Our success with the Everglades project resulted from developing a collaborative framework for actively communicating with and promoting participation of all interested parties in the planning and decision-making process. This participation fostered an open dialogue on sometimes competing or conflicting water resource needs that had to be integrated into a comprehensive plan. We believe that this concept of integration is the key to meeting the water challenges that we collectively face. Based on what our State and local partners told us, we adopted nine Watershed Principles to guide our water resources management.

These Watershed Principles are:

1. Seeking sustainable water resources management;
2. Integrating water and related land management;
3. Considering future water demands;
4. Coordinating planning and management;
5. Promoting cooperation among government agencies at all levels;
6. Encouraging public participation;
7. Evaluating monetary and non-monetary trade-offs;
8. Establishing interdisciplinary teams; and,
9. Applying adaptive management as changing conditions or objectives warrant.

Within this broad context, watershed partners must collaborate to simultaneously address multiple objectives - environmental quality, social effects, and national and regional economic development.

Q2. What do you think are the Corps' most relevant experiences for Great Lakes restoration?

A2: The Corps has several ongoing studies, projects and programs that are very relevant to the restoration of the Great Lakes ecosystem. There are common methodologies that have been utilized in these efforts. They include (1) a multi-agency (Federal, State, Tribal, and local), collaborative process with

significant public and stakeholder input; (2) a comprehensive decision making framework that allows for trade-offs among competing interests and prioritization; and (3) a goal of sustainability, balancing the environment and economics.

Examples of such studies, projects and programs include the International Joint Commission Lake Ontario - St. Lawrence Seaway Study; the Lake St. Clair Management Plan (Section 426, Water Resources Development Act (WRDA) of 1999); the Onondaga Lake Partnership (Section 573, WRDA 1999); the Western Lake Erie Basin study (Section 438, WRDA 1999); the Great Lakes Remedial Action Plans & Sediment Remediation (Section 401, WRDA 1990); the Great Lakes Tributary Models (Section 516(e), WRDA 1996); and the Environmental Dredging Program (Section 312, WRDA 1990).

In addition, the Corps is presently obtaining knowledge that is particularly relevant in framing an overall Great Lakes Restoration Plan. The John Glenn Great Lakes Basin Program (Section 455, WRDA 1999) authorizes the analysis of all the Corps authorizations with respect to the Great Lakes and performs a gap analysis. Information on State programs is also being collected. Data is being collected and analysis performed in the areas of biological data, hydrologic data and recreational boating. The Great Lakes Fishery & Ecosystem Restoration Program (Section 506, WRDA 2000) targets high priority aquatic populations for habitat restoration in conjunction with the Great Lakes Fishery Commission. Continuing authorities programs such as Section 1135, WRDA 1986, and Section 206, WRDA 1996, are being utilized to restore and protect ecosystems within of the Great Lakes basin.

Q3. You spoke in your testimony about several on-going studies the Corps is currently involved in. What connections are there between the Corps' studies and Great Lakes restoration?

A3. Overall, the key connection between the Corps' studies and Great Lakes restoration is the development of effective working relationships between the Corps and other agencies and groups in working on Great Lakes issues. Through its efforts on a variety of studies and programs, the Corps has established links with a multitude of stakeholders including environmental and economic interests in both the U.S. and Canada. Establishment and coordination of a bi-national framework, consisting of Federal, State, Tribal and local agencies, is a key first step in implementing a Great Lakes restoration plan.

In order to be effective, a plan for Great Lakes restoration must be developed in conjunction with other on-going efforts, such as the current study of the Great Lakes and St. Lawrence Seaway navigation system. The current environmental baseline study would provide vital information on past, current and projected future conditions of the Great Lakes and St. Lawrence Seaway, which would be required to develop a meaningful plan for restoration.

The work being conducted under the John Glenn Great Lakes Basin Program and the Great Lakes Fishery and Ecosystem Program would also provide information that would be critical in developing a meaningful plan. The Corps has also been charged to engage multiple agencies, stakeholders and the public in developing comprehensive restoration plans for Lake Onondaga and Lake St. Clair. Many of the local, State, Provincial, Tribal, and Federal (U.S. and Canada) agencies that would have to work together on a Great Lakes restoration plan have been brought together to develop these plans.

RESPONSES TO QUESTIONS FOR MR. KEENEY

Issues and Questions from the Senate Committee on Governmental Affairs, Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia

July 16, 2003

Great Lakes Restoration Management

Question: Mr. Keeney, you stated in your testimony that NOAA recently awarded two grants for the purpose of providing technical and scientific support in the development of a comprehensive ecosystem restoration plan for the Great Lakes. Please explain in greater detail what the grants are for, what program the money is coming from, what the grantees will produce, and how the support will be used.

Answer: As stated in our testimony, NOAA has recently awarded two grants that will further the development of this overarching restoration plan for the Great Lakes. Under these grants, the Great Lakes Commission and the Northeast-Midwest Institute, in partnership with the Great Lakes Sea Grant Network, will provide technical and scientific support to the Region's leadership in the development of a comprehensive ecosystem restoration plan.

What are the grants for?
The grants will provide resources to help the Great Lakes region advance restoration by developing science-based restoration priorities and helping to understand successful strategies used by other regions.

Under the first grant, the Great Lakes Commission, in partnership with the Great Lakes Sea Grant Network, will undertake a two-year initiative to research ecosystem problems and needs, assess existing restoration initiatives, conduct focus groups that build on the development of state and provincial priorities, and convene a restoration planning forum to address desired outcomes. This effort will help unify the many existing strategic plans from partner agencies, and NOAA looks forward to working in partnership with EPA, states, and others in this effort.

Complementing this research, the Northeast-Midwest Institute will use the funding under the second grant to review the approaches that other regions have used to launch major ecosystem restoration initiatives in order to provide guidance for the Great Lakes planning effort. This case study approach will characterize these other plans, describe their elements in detail, identify problems and opportunities, and help inform the *Great Lakes Restoration Plan* development and implementation process. These two related initiatives will be carefully timed and coordinated.

What will the grantees produce?
The activities under the grants will result in detailed science-based published information and outreach efforts that will be needed to develop the comprehensive *Great Lakes Restoration Plan.*

The Commission will produce a series of recommendations for restoration priorities to form the basis of the Plan development and to assist regional Governors and decision-makers in restoration efforts. The Institute will produce a report summarizing the results of their research on other regions also for consideration as Plan development proceeds. This effort will meet an urgent need to get the planning process underway so that the efforts of the multiple local, state and Federal stakeholders can proceed in a coordinated manner.

How will the support be used?
The support provided through the activities outlined above will provide the region's leadership (i.e. Congressional Great Lakes Task Force and Great Lakes governors) with a menu of science-based restoration goals and strategic actions that can be adopted as priorities for advocacy efforts. It will provide the Great Lakes Commission with a basis for developing its annual legislative and appropriations priorities, as provided for in its enabling legislation. It will provide the Great Lakes Sea Grant Programs with guidance in targeting their research, education, and outreach services. And, it will provide the larger Great Lakes community with both a valuable coordination/communication process as well as the type of detailed blueprint for ecosystem restoration that has long been needed. Among the plan's distinguishing characteristics- and the basis for its prospective success- will be its focus on the science/policy interface.

The plan will receive maximum and sustained exposure to impact legislative, appropriations, program, and policy decisions through a commitment by the Commission and Great Lakes Sea Grant Programs to develop and pursue a strategy of publicity, implementation, and maintenance.

From what program is the money coming?
Funding for a Great Lakes restoration initiative in the amount of $315,000 will come from the National Oceanic and Atmospheric Administration's National Sea Grant College Program. Matching support from both the Commission and Institute are required raising the total funding for the initiative to $473,000.

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September 2, 2003

The Honorable George V. Voinovich, Chairman
Subcommittee on Oversight of Government Management,
the Federal Workforce and the District of Columbia
442 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Voinovich:

Thank you for the opportunity to testify before your subcommittee this past July 16, 2003 on "Great Lakes Restoration Management," and for the transcript of the proceedings. I hope you found my comments of value as you seek to improve the efficacy and efficiency of programs vital to the restoration of the Great Lakes.

Please accept my sincere apologies for this belated reply to your questions concerning the State of the Lakes Ecosystem Conference (SOLEC) and the National Aquatic Invasive Species Act of 2003 (S. 525) that you have co-sponsored. I have been on an extended road trip that has taken me literally from coast to coast over the past five weeks and I encountered some difficulty in making a timely response. I hope that I am not too late to add my respectful comments to your deliberations.

Before answering your questions, permit me to commend you for your thoughtful leadership in helping to restore the greatness to the Great Lakes.

SOLEC

During the July 16, 2003 hearing you asked several questions about the State of the Lakes Ecosystem Conference (SOLEC), what it is presently addressing, and how it might be helpful in addressing the findings and recommendations of the GAO report. The following information is provided from my personal perspective as chairman of the U.S. Section of the International Joint Commission (IJC).

Under the binational Great Lakes Water Quality Agreement (the Agreement), the IJC is charged with biennially assessing the compliance of both the U.S. and Canada with the terms and conditions of the Agreement. In effect, the IJC is the "watchdog" over the

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Agreement. As you know, the great purpose of the Agreement is "to restore and maintain the physical, chemical, and biological integrity of the Great Lakes Basin ecosystem." The 148 federal and 51 state programs identified by the U.S. GAO in its recent report are all designed to directly or indirectly achieve this great purpose.

SOLEC conferences have been co-hosted by the U.S. Environmental Protection Agency (EPA) and Environment Canada (EC) on behalf of the two countries every two years since 1994 in response to the Agreement obligation of the governments to bienially report on the state of the Great Lakes. SOLEC conferences are forums in which the two countries report on the health of the Great Lakes ecosystem and the major factors affecting its condition. In the odd years following each SOLEC conference, the governments issue a joint "State of the Great Lakes" report based on the findings from the preceding conference. SOLEC conferences do not focus on the status of restoration programs, but rather on the effectiveness of those programs through measured changes in the ecology of the lakes.

Although it is very important for policy makers and the public to be able to track changes in the ecological quality of the Great Lakes, finding ways to report on these changes in a coherent and understandable manner is difficult. So, in 1987 Canada and the U.S. agreed to develop Ecosystem Health Indicators for all of the Great Lakes to assist in evaluating progress towards achieving the purpose of the Agreement. The IJC assisted this effort, and in 1994 the first SOLEC conference was held. However, from the very beginning it became apparent that efforts to develop an ecological "report card" for the Great Lakes was severely constrained by the availability of objective data.

Indicators can be thought of as pieces of evidence that provide information on matters of broader concern. For example, the legendary "canary in the coal mine" served as an indicator of the buildup of harmful gases in the mine. Indicator values reflect the condition of a given environmental function or service that extends beyond the measurement itself. Consistent use of indicators over time yields a means to assess temporal and spatial trends in environmental quality. When an end point or target for a specific indicator is established, the indicator can show how close we are to achieving the goal and the broader set of conditions it reflects.

Good indicators measure more than one factor of ecosystem health, and taken together, a suite of indicators can be used to better understand the complexity of the Great Lakes, help guide policies, programs, and decision-making, and inform the public of progress towards restoration.

As previously noted, the IJC is responsible for evaluating progress in meeting the purpose and goals of the Agreement, and the party governments are also obligated to report biennially on progress. Regular reporting on an agreed upon set of indicators meets the needs of both governments and the IJC while avoiding duplication.

However, as early as 1996, the IJC identified difficulties related to incompatible sampling protocols, different reporting formats, lack of uniform data quality, gaps in

sampling and analysis, gaps in temporal and spatial data, and differing surveillance and monitoring activities used by agencies in the Great Lakes basin that impede the use of indicators to assess progress towards restoration. To better focus indicator development and data collection, a 1996 IJC task force established nine desired outcomes (i.e., targets or endpoints) drawn directly from the list of fourteen beneficial water uses in Annex II of the Agreement. The IJC recommended that the governments initially focus their efforts on three: Drinkability, Fishability, and Swimmability. These three desired outcomes are of particular interest to the public because they correspond to their most direct use of the Great Lakes.

In 1999, the IJC recommended that the governments report on these three desired outcomes at their 2000 SOLEC conference. While previous SOLEC conferences were focused on the identification and development of a suite of science-based indicators that would reflect changes in ecosystem health (ultimately, over 80 such indicators were developed), SOLEC 2000 was the first conference to begin the actual use of indicators to assess the state of the Great Lakes.

Indicators of ecosystem health are assessed on a five-grade scale ranging from "good" to "mixed improving", "mixed", "mixed deteriorating", and "poor". The assessments are based on the SOLEC authors' best professional judgment based on the scientific data collected. The attached SOLEC "report card" is provided as an example of how the Great Lakes fared in the most recent indicator assessment.

In its 11th Biennial Report issued in September of 2002, the IJC provided its first detailed examination of SOLEC indicators for the desired outcomes of Drinkability, Fishability, and Swimmability. The following briefly describes our findings and the associated difficulties with each indicator.

Desired Outcome: Drinkability

Definition: "Treated drinking water is safe for human consumption; human activities do not result in application of consumption restrictions."

The SOLEC authors' assessment of Drinkability was "good," that is, "the state of the ecosystem component is presently meeting ecosystem objectives or otherwise is in acceptable condition." The IJC concurred with this finding, and noted that "good" is the highest rating given under the SOLEC scale.

The basis for this assessment was data collected from 22 cities that obtain their drinking water from the surface water of the Great Lakes. Five characteristics of raw water going into treatment plants were evaluated: turbidity, organic matter, pathogens, chemical contaminants, and taste and odor.

As an indicator, the IJC observed that the condition of raw water reflects local water conditions as well as overall water conditions in the Great Lakes. The condition of raw surface water affects treatments costs to meet drinking water standards.

The primary challenge with this indicator is to standardize testing protocols and reporting formats in each country at the level of the local water treatment plant so that data are comparable. Using your orchestral analogy, we need each local jurisdiction in each country using the same song sheet.

The IJC also noted that while the SOLEC indicator focused on surface water, the public is interested in the quality of their tap water. Thus an expansion of SOLEC data collection to include cities that rely upon groundwater for drinking would greatly improve the value of this indicator.

Desired Outcome: Fishability

Definition: "There shall be no restrictions on the human consumption of fish in the waters of the Great Lakes basin ecosystem as a result of anthropogenic inputs of persistent toxic substances."

The SOLEC authors' assessment of this indicator was "mixed improving," that is, "the ecosystem component displays both good and degraded features, but overall, conditions are improving toward an acceptable state."

The basis for the SOLEC assessment was the application of a uniform set of health standards to historical data on PCBs in coho salmon. The results showed a slight decrease in PCB concentrations over time. PCBs are a frequent basis for health-based fish consumption advisories, and coho salmon is a top predator and popular sport fish.

The IJC task force that helped to develop this indicator noted that trends in PCBs, DDT, and mercury concentrations in several species of top predator fish like walleye, lake trout, and coho salmon could be used as indicators, as could the number of added, altered, or lifted advisories. SOLEC used PCBs and coho salmon.

The IJC view on this indicator is that it is a good initial effort, but that data on a single contaminant in a single species of fish is insufficient for a thorough assessment of the desired outcome. Trends in this indicators could be corroborated by analyzing trends of contaminants in fish-eating wildlife species like otters, mink, snapping turtles, and bald eagles, as well as herring gull eggs.

The challenge for this indicator is again related to slight differences in sampling, measurement, and analytical protocols between the eight states and two provinces that have jurisdiction over these measurements. Each state and province issues its own fish consumption advisories using their own analytical techniques. Comparability and compatibility of results is thus compromised. If there were uniform protocols applied, this indicator would be of much greater value.

Desired Outcome: Swimability

Definition: "no public bathing beaches closed as a result of human activities or conversely, all beaches are open and available for public swimming."

The SOLEC assessment of this indicator is "mixed," that is, "the state of the ecosystem component has some features that are in good condition and some features that are degraded, perhaps differing between lake basins."

This indicator is based on measurements of *E. coli* levels in water and on the number of beaches closed.

The IJC agreed that it is not always safe to swim at certain Great Lakes beaches, and importantly, that there is a limited ability to define progress.

Beaches are sampled and regulated by local jurisdictions, and the challenge is again to ensure uniformity of sampling and reporting methods. U.S. beach survey data are centrally compiled, however, Canadian beach data is not. Thus, this indicator of overall Great Lakes beach health has severe limitations and an assessment of progress cannot be made.

The above three examples of indicators of direct concern to the public illustrate some of the difficulties in assessing overall progress in restoring the physical, chemical, and biological integrity of the Great Lakes ecosystem. It is important to remember that the development of SOLEC indicators is a completely voluntary process that depends upon the cooperation of many, many local, state, provincial, and federal agencies.

Less than half of the 80-plus SOLEC indicators have adequate data supporting their use to assess progress towards restoration of physical, chemical and biological integrity. Much of the data is gathered by local or state and provincial jurisdictions utilizing slightly different methods and analytical protocols. SOLEC organizers do not maintain original data or copies of underlying supporting data – the data reside with the cooperating agency or organization. In short, the value of each SOLEC indicator is only as good as the quality of the data supporting it.

Permit me to make the following observations with respect to SOLEC indicators in the context of the GAO report:

1) The utility of indicators to inform and guide policy and program decisions, as well as to keep the public appraised of progress in restoring the Great Lakes is obvious. However, a significant investment in a coordinated surveillance and monitoring system is required to produce reliable, comparable, and compatible data to support indicator development. The best place to start is with the three core desired outcomes of

drinkability, fishability, and swimmability. In this regard, I commend your leadership in co-sponsoring S. 1398.

2) Expanding the number of indicators, currently at 80-plus and growing, should only occur after the data and methods are fully developed for the three core desired outcomes noted above. The indicator process can quickly become a series of "pet rocks" for the scientists and agency heads involved unless clear direction is given with regard to priorities.

3) Making indicator assessments and the underlying data and analysis public and transparent will aide in public understanding of the link between the many programs operating to restore the Great Lakes and actual ecological improvements.

4) Given the voluntary and cooperative nature of SOLEC indicator development, it is clear that from an organizational point of view, there needs to be a powerful, well-funded coordinator in charge of the process – the conductor you so eloquently described in your comments to the subcommittee.

5) Finally, the important job of objectively assessing how well both the U.S. and Canada are living up to the terms and conditions of the Agreement they signed over 30 years ago must continue to be done by an independent, science-based body that is not beholden to the mandates of either party to the Agreement – the IJC. The IJC must continue to be adequately supported to fulfill this important mission.

THE NATIONAL AQUATIC INVASIVE SPECIES ACT of 2003 (S. 525)

The IJC is vitally concerned and actively involved in the battle against invasive species because of its "watchdog" role under the Great Lakes Water Quality Agreement and its stature as the pre-eminent binational organization charged with responsibility for this vast, shared ecosystem. Invasive species pose a most significant threat to the integrity of the Great Lakes ecosystem that is shared between the U.S. and Canada. The seriousness of this threat has compelled the IJC to investigate the invasive species problem, alert the governments of the United States and Canada, and become actively engaged in deliberations as to actions that may be taken to prevent future invasions and control those that already exist.

Permit me to preface my detailed comments on S. 525, the National Aquatic Invasive Species Act of 2003 (NAISA), with some observations on the gravity of the invasive species threat to the ecology and economy of the Great Lakes. In my judgment, invasive species pose the single greatest threat to the biological integrity of the Great

Lakes ecosystem, and action by the Congress such as that proposed in S. 525 is urgently needed. I strongly commend you for your co-sponsorship of this vital legislation.

While I understand that NAISA and the problem of invasive species is national (indeed, multi-national) in its scope, I wish to focus on the import of this legislation to the Great Lakes. The Great Lakes are now home to over 180 non-native invading species and a new invader is being discovered at the rate of one every 8 months. Introductions create new competition for food, change trophic levels, alter habitat, and change the interaction between species. In the absence of effective controls, invasive species permanently alter the ecosystem – and as we have witnessed, often for the worse.

Invasive species also threaten the economy of the Great Lakes. Citizens pay more for their drinking water, more for their electricity, and more for goods produced by the water dependent industries of the Great Lakes due to the costs imposed by the invading zebra mussel. Beyond the millions of dollars of public expenditures to control established invaders like the sea lamprey, millions of dollars are spent each year to ream zebra mussels out of water intake pipes by municipalities, utilities, and industry. Recreation and tourism is threatened by the fouling of beaches and declines in the native sport fishery. Indeed, the entire $5 billion dollar per year sport and commercial fishery is at risk from the Asian Carp that is working its way up the Mississippi River towards the Great Lakes. This invader threatens pleasure boating, water skiing, and swimming as well.

Invaders can enter aquatic ecosystems through a variety of pathways including shipping activities, aquaculture, aquarium trade, live bait, and direct hydraulic connections between water basins. Recently, ballast water exchange that is essential to safe shipping has been a major focus for efforts to prevent unintended introductions of non-native species. It is estimated that more than 10,000 marine species are transported each day in ballast water, and many of our most devastating invaders (e.g., zebra mussels, quagga mussels, round goby, spiny water flea, etc.) have arrived via this vector. Because shipping is commerce that is international in scope, this vector for invasion is the rightful purview of the U.S. federal government.

Other vessel vectors include hull, sea chest, and anchor chain fouling and No Ballast on Board (NOBOB) ships that are exempt from current regulations requiring open ocean ballast water exchange. Approximately 85% of the foreign vessels entering the Great Lakes each year do so fully loaded and with "no ballast on board" – these NOBOB vessels are not able to conduct ballast water exchange for safety reasons and they are thus exempt from the only existing regulations designed to prevent introductions of invasive species. However, thousands of tons of unpumpable sludge, replete with living and potentially viable eggs, spores and cysts of invaders remain in the ballast tanks of NOBOB vessels waiting to be re-suspended and discharged as the vessel off- and on-loads cargo among many ports once the ship is in the Great Lakes. Clearly, existing regulations are not effective in preventing ballast water mediated invasions. This assertion is confirmed by the fact that approximately 15 new species have invaded the

Great Lakes since 1993 when regulations requiring open ocean ballast water exchange became law.

Another pathway for invasion that is directly addressed by S. 525 is the "revolving door" to the Great Lakes formed by the Chicago Ship and Sanitary Canal – a direct, hydraulic connection between the two largest water basins in North America, the Mississippi River and the Great Lakes. Until recently, the canal was a "killing zone" of toxic discharges and wastewater effluent that did not permit the passage of species between basins. However, the advent of the Clean Water Act and improved wastewater treatment has turned this killing zone into a corridor for the passage of species. It is a "revolving door" to the Great Lakes because species passage can occur in both directions.

The Asian Carp (i.e., the silver and bighead carp) were initially imported into the U.S. by catfish farmers in Arkansas to control weeds and algae in the early 1970's, but they escaped into the open waters of the Mississippi River during the floods of the late 1980's and '90's and are now working their way towards the cool waters of the Great Lakes that are so similar to those of their native habitat. These large (up to 100 lb.), voracious planktivores gobble up to 40% of their body weight each day from the very bottom of the food chain that sustains life in the lakes. They are very prolific (mature females carry up to 2 million eggs each) and have already taken over large sections of the Mississippi River, destroying sport and commercial fishing operations in large stretches of the river. They could potentially turn the Great Lakes into a "carp pond" and cause untold ecologic and economic damage.

NAISA (S. 525) directly confronts the Asian Carp threat by fully funding a redundant set of electrical barriers designed to prevent passage of the carp through the canal. The bill will improve the existing temporary barrier and make it permanent, and add an additional barrier for redundancy. Full funding is provided for construction, operations, back-up power, maintenance, and fish monitoring. Two barriers are needed in the event that one goes down due to an electrical outage, and to allow for routine maintenance. In addition, funding is provided for rapid response planning and operations should the carp threaten to pass through the barriers.

NAISA (S. 525) also invests in long-range planning with respect to the Chicago Ship and Sanitary Canal by providing funds to the Army Corps of Engineers to conduct a feasibility analysis of the full range of options available to prevent the future spread of aquatic invasive species through the canal. As a participant in Mayor Daley's recent summit on invasive species and the canal, I believe that this study is critical to long-range means of preventing species passage through the canal.

Detailed Comments on S. 525

Sec. 2. Findings:

- Congress should recognize that many successful invasions can neither be eradicated nor controlled and that adaptive management of the affected

ecosystem is then necessary to optimize human beneficial use of the resource.

- The monitoring of pathways and ecosystems should include identification, survey, and assessment of foreign aquatic ecosystems that are known, significant sources of invaders to the Great Lakes and other U.S. aquatic ecosystems. This way, limited resources can be used more effectively, and species to look for under early detection provisions can be targeted. For example, the ports of Antwerp and Rotterdam are key sources of invasive species for the Great Lakes.

Sec. 3. Definitions:

- "Water basins should be defined.
- "Infestation" should be defined.
- "Historic range" should be defined. For examples, some species like the alewife entered the Great Lakes a very long time ago and are now considered an essential forage fish. Is it still nonindigenous? How long ago does an invasion have to occurred in order for the invaded ecosystem to be considered within the species "historic range?" The answer depends on how "historic range" is defined.
- The definition of the International Joint Commission should also reference its role under the Great Lakes Water Quality Agreement in assessing progress and assisting the governments of Canada and the U.S. in restoring and maintaining the physical, chemical and biological integrity of the Great Lakes basin ecosystem.

Sec. 1101. Prevention of Introduction of Aquatic Invasive Species into Waters of the United States by Vessels:

- This section does not mention the vitally important role of NOBOB ("no ballast on board") vessels in mediating transfers of invasive species into the Great Lakes (and other waters). The section is primarily concerned with ballast *water* management while management of sediments and other residuals is a matter of ballast *tank* management. Subsection 3 (B) (i) could be strengthened to address the cleaning and maintenance of ballast tanks, hulls, anchor chains, and sea chests.
- The master of a vessel should be required to provide a "sample of ballast water suitable for biological analysis" upon the request of the Coast Guard. Advances in DNA technology may soon allow the tracing of a given species to its port of origin and samples can help identify the specific involved in the transfer. Though potentially onerous, such a provision would quickly engage the marine insurance industry in efforts to identify and install effective treatment technologies.
- The bill would establish an <u>interim standard</u> of 95% kill or removal of living organisms from ballast water discharge. This numeric standard would replace the current narrative standard for treatments being "at least as effective as ballast water exchange." By finally setting an objective, measurable numeric standard, the bill will break the logjam that has prevented engineers and shippers from

pursuing treatment technologies and advance a national policy encouraging ballast water treatment. While the U.S. EPA and others state technical measurement difficulties with this standard and prefer a standard based on an allowable concentration of organisms or removal of all organisms larger than a certain size (e.g., 50 microns), it is important to start somewhere and not let the perfect get in the way of the possible. Moreover, the details of measurement are not spelled out in the bill because they are better left to regulation. It is important to note that measurement based on size or allowable concentration is not precluded by the interim standard established in the bill.

- The bill would require the establishment of a final numeric standard with the goal of eliminating the risk of introducing nonnative species into U.S. waters. The final standard wisely includes the whole ship as a vector for species transfers. Four years to develop and several more years to promulgate a final numeric standard is unfortunately, a very long time, but the sooner we get past the debates and into implementation, the better.

- The bill puts new ships on a faster track towards installation of treatment technologies by requiring all ships that enter service after January 1, 2006 to incorporate ballast treatment. This is appropriate because the marginal cost of installing a treatment technology is least during new construction. The best available technology requirement is appropriately different for new ships and existing ships given the constraints of retrofitting.

Sec. 1210. Priority Pathway Management Program

- It is important in identifying high priority pathways for introductions to identify significant foreign source regions, the species located there, those that are likely to infest U.S. waters, and the likely means of transport to U.S. waters. For example, it is well known that certain European ports (e.g., Antwerp and Rotterdam) pose a high risk of species transfers to the Great Lakes.

Sec. 1106. Early Detection and Monitoring.

- Again, while it is important to conduct ecological surveys to early detect invaders, this work can be made more efficient by surveying significant foreign sources (e.g., ports) of potential invaders to inform and alert surveyors monitoring U.S. waters for infestations.

- Also, it is not clear who is actually in charge of implementing a national system of ecological surveys – USGS, NOAA, or EPA?

Sec. 1211. Rapid Response.

- Plans and funding for rapid response should be allowed for individual species such as the Asian carp.

- Federal rapid response teams should, where practicable, be organized on a watershed or basin basis. The 10 federal regions do not necessarily line up with the nation's major watersheds. For example, the Great Lakes basin engages several federal regions.

Sec. 303. Dispersal Barriers

- The reference to the " Chicago River Ship and Sanitary Canal" should be changed to "Chicago Sanitary and Ship Canal," its proper name.

Sec. 1110. Technology Development Demonstration and Verification

- A critical component of technology research, development, and verification is the availability of actual ships to utilize as test platforms for various treatment technologies. This very real and difficult problem is not addressed in the bill. Currently when research is being conducted on operating ships, the basic rule governing cooperation with shippers is that the experiments cannot interfere with the ship's cargo or delay the ship's schedule in any manner. Providing for the chartering of commercial vessels strictly for research would solve this major problem. The charter of ships for research purposes is costly, but likely the fastest way to successful and speedy testing of ballast water treatment technologies under real operating conditions.

Sec. 1402. International Coordination.

- The Great Lakes are a shared ecosystem between the U.S. and Canada. Therefore, any measures taken by the U.S. must be coordinated with like measures in Canada or they will be ineffective. The IJC is uniquely situated to facilitate binational cooperation to protect the Great Lakes from future introductions of invasive species.

Sec. 1301. Authorization of Appropriations.

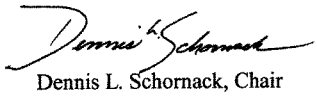
- (c) INTERNATIONAL COORDINATION: The reference should be to Sec. 1402, not Sec. 1403.

Permit me to comment for a moment on the potential for solving the invasive species problem in the Great Lakes basin as a first step towards a national and international solution. The Great Lakes is a unique, freshwater ecosystem that is particularly vulnerable to ballast water mediated aquatic invasions because of the nature of the trade relationships between the region and Europe. The universe of ships (approximately 400), ship designs (mostly bulk carriers), ports of origin and destination and shipping lines are very limited, and thus very manageable in the Great Lakes. Shipping routes and characteristics are well understood. And all ships must pass through the single gateway of Cornwall, Ontario and Massena, New York that is controlled by the U.S. and Canada.

Clearly, the U.S. and Canada have the unique opportunity to set the pace for the rest of the world in preventing invasions by moving ahead with a common standard and a single set of regulations uniformly applied at the single gateway to the Great Lakes. Waiting to solve the global marine problem may unnecessarily risk more invasions when action to protect the Great Lakes may be taken on a more expedited timetable. The IJC is prepared to assist in investigating this matter.

Thank you for the opportunity to comment on the SOLEC indicators and the pending NAISA (S. 525).

Sincerely,



Dennis L. Schornack, Chair
U.S. Section
International Joint Commission

SOLEC 2002
State of the Lakes
Ecosystem Conference
SOLEC 2002

SOLEC 2002

State of the Lakes Ecosystem Conference 2002
Biological Integrity of the Great Lakes

Overview

As parties to the Great Lakes Water Quality Agreement, the governments of Canada and the United States are responsible for accurate reporting on the state of the Great Lakes. The State of the Lakes Ecosystem Conference is a result of this commitment for reporting. With the establishment of a consistent suite of ecosystem indicators, the health of the Great Lakes basin can be objectively assessed. Regular reporting of a core set of indicators will promote more efficient and successful management as well as creating more accessible information for policy makers and the public.

The first two conferences in 1994 and 1996 developed a series of *ad hoc* indicators to evaluate the state of various Great Lakes ecosystem components. SOLEC 98 went beyond the previous SOLECs and presented a comprehensive list of ecosystem indicators for review and discussion. This suite of indicators objectively represents the state of the Lakes while establishing consistent biennial reporting. SOLEC 2000 began the actual assessment of the state of the Great Lakes using the suite of indicators.

SOLEC 2002 will focus on continuing to update and assess the state of the Great Lakes using the suite of indicators with an emphasis on biological integrity.

U.S. EPA - Courtesy of Michigan Travel Bureau

Biological Integrity

The theme for SOLEC 2002 is biological integrity. "Integrity" is not specifically defined in the Great Lakes Water Quality Agreement (GLWQA), therefore the following definition will be used during SOLEC 2002:

> ***"biological integrity is the capacity to support and maintain a balanced integrated and adaptive biological system having the full range of elements (the form) and processes (the function) expected in a region's natural habitat."***
>
> -by James R. Karr, modified by Douglas P. Dodge

The challenge for SOLEC 2002 and beyond, is to prepare a list of indicators that integrate information collected at all trophic levels in the basin. This integration will provide indicators to measure the state of biological integrity in the Great Lakes.

Indicator Assessment*

SOLEC Assessment Scheme

- ✔ Good
- Mixed, Improving
- Mixed
- Mixed, Deteriorating
- Poor

This executive summary presents assessments on 19 of the 45 indicators from the following categories: (1) ecosystem health (2) human health (3) chemical/ physical and biological stressors and (4) human response/activities. The authors of the indicator reports were asked to assess, in his or her best professional judgment, the overall status of the ecosystem component in relation to established endpoints or ecosystem objectives, when available. Five broad categories were used:

GOOD – the state of the ecosystem component is presently meeting ecosystem objectives or otherwise is in acceptable condition.

MIXED, IMPROVING – the ecosystem component displays both good and degraded features, but overall, conditions are improving toward an acceptable state.

MIXED – the state of the ecosystem component has some features that are in good condition and some features that are degraded, perhaps differing between lake basins.

MIXED, DETERIORATING – the ecosystem component displays both good and degraded features, but overall, conditions are deteriorating away from an acceptable state.

POOR - the ecosystem component is severely negatively impacted and does not display even minimal acceptable conditions.

*** The assessments are extracted from the 2002 Implementing Indicators Report which is avaliable at SOLEC 2002.**

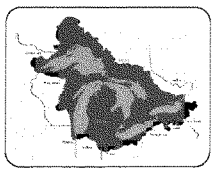
Management Challenges

HABITAT ALTERATIONS

- Encourage place-based stewardship activities
- Control suburban sprawl, minimize human habitation impacts
- Identify, protect, rehabilitate critical habitats, both aquatic and terrestrial

CONTAMINANTS AND PATHOGENS

- Emphasize agricultural best management practices
- Foster contaminant reducing activities, mass transit, energy efficiency, recycling
- Encourage brownfield redevelopment



NON-NATIVE SPECIES

- Understand relationship between economic well being and increased threat of introducing non-native species
- Prevent non-native species introductions
  Continue maintenance of sea lamprey control

	Indicator	Ecosystem Objective	Assessment	State of the Ecosystem
Human Health U.S. EPA	*E.coli* and Fecal Coliform Levels in Nearshore Recreational Waters	• Waters used for recreational activities involving bodily contact should be substantially free from pathogens, including bacteria, parasites and viruses, that may harm human health		• Recreational waters have become contaminated with animal and human feces from sources such as combined sewer overflows, that occur in certain areas after heavy rains, agricultural runoff and poorly treated sewage • From 1998-2000 both U.S. and Canada, showed some variation in beach closures as a result of changing sampling regimes. • It has been observed in the Great Lakes basin that unless new contaminant sources are removed or interdicted, beaches tend to respond with similar bacterial levels after events with similar precipitation and meteorological conditions
	Drinking Water Quality	• To have all treated drinking water safe to drink and free from chemical and microbial contaminants	✔	• Overall the quality of the drinking water in the Great Lakes basin is good. This is in large part due to our current technologies • Minimal risk of human exposure to chemical contaminants • Turbidity levels are declining in source water • Total coliform and *E.coli* levels are highest in raw waters especially during the spring, summer and early fall
	Air Quality	• Air should be safe to breathe, and thus air quality in the Great Lakes ecosystem should be improved and protected		• Overall there has been significant progress in reducing air pollution in the Great Lakes basin • For most substances of interest, both emissions and ambient concentrations have decreased over the last 10 years or more, however these concentrations depend on weather and climate conditions
	Chemical Contaminants in Edible Fish Tissue	• The health of humans in the Great Lakes ecosystem should not be at risk from contaminants of human origin. Fish and wildlife in the Great Lakes ecosystem should be safe to eat; consumption should not be limited by contaminants of human origin.	➡	• Since the 1970s, there have been declines in many persistent bioaccumulative toxic (PBT) chemicals in the Great Lakes basin • However, PBT chemicals, because of their ability to bioaccumulate and persist in the environment, continue to be a significant concern • Fish Consumption Advisory Programs are well established in the Great Lakes. All jurisdictions have extensive fish contaminant monitoring programs and issue advice to their residents about how much fish and which fish are safe to eat
Ecosystem Health	Walleye	• To restore and protect historically important, mesotrophic habitats that support natural stocks of walleye as the top predator fish		• Reductions in phosphorus loadings in the 1970's and fishery management programs in the 1980's both led to increased adult survival of Walleye, especially in Lake Erie • Declines after the mid 1990's through to 2001 occurred in most areas due to shifting environmental states and changing fisheries
	Hexagenia	• To restore and maintain a balanced, stable, and productive Great Lakes basin ecosystem with *Hexagenia* as the dominant, large, benthic invertebrate	➡	• Historical declines in the abundance of *Hexagenia* in some Great Lakes habitats • Declines linked to eutrophication, low dissolved oxygen in bottom waters and pollution of bottom sediments • Strong recovery in western Lake Erie shows that properly implemented pollution controls can bring back recovery of a major Great Lakes mesotrophic ecosystem
	Sea Lamprey	• To control sea lamprey in supporting fish community objectives, in particular objectives for lake trout, the top native predator	➡	• The first complete round of stream treatments with the lampricide TFM, as early as 1960 in Lake Superior, successfully suppressed sea lampreys to less than 10% of their pre-control abundance in all of the Great Lakes • Recent increases in sea lamprey in the Great Lakes have signaled a need for increased stream treatments; however it will take another 2-4 years to see any significant effect on lamprey populations
U.S. EPA	Lake Trout	• To restore lake trout as a principal salmonine predator in the coldwater communities of the Great Lakes		• Lake trout abundance dramatically decreased in the Great Lakes after the introduction of sea lamprey • Rehabilitation will not be achieved until natural reproduction is established, and to date, sustained natural reproduction is only occurring in Lake Superior, and some areas of Lake Huron
	Diporeia	• To maintain a healthy, stable population of the benthic macroinvertebrate *Diporeia* in offshore regions of the main basins of the Great Lakes	⬅	• Populations are currently in a state of decline in portions of Lakes Michigan, Ontario, Huron and Eastern Lake Erie • In areas of the Lakes where *Diporeia* is still present, abundances are much lower than the 1970's and 1980's • Declines coincide with introduction of non-native mussel species
	Amphibian Diversity and Abundance	• To maintain diversity of Great Lakes wetland amphibian communities, and to sustain breeding amphibian populations across their historical species range	⬅	• Some amphibian populations are declining (American toad, Chorus Frog, and Green Frog), but this could be a natural periodic fluctuation. Only continued monitoring will tell us the real trend

	Indicator	Ecosystem Objective	Assessment	State of the Ecosystem
	Coastal Wetlands Area by Type	• Reverse the trend toward loss of Great Lakes coastal wetlands, ensuring adequate representation of wetland types across their historical range	⬅	• Wetlands continue to be lost and degraded, yet the ability to track and determine the extent and rate of this loss in a standardized way is not yet feasible • Efforts are under way to assess the use of remote sensing technologies to determine the extent of wetland loss.
Chemical/ Physical and Biological Stressors	Phosphorus	• The goals of phosphorus control are to maintain an oligotrophic state in Lakes Superior, Huron and Michigan; and to maintain algal biomass below nuisance conditions in Lakes Erie and Ontario	▭	• Strong efforts begun in the 1970's to reduce phosphorus loadings have been successful in maintaining or reducing nutrient concentrations in the lakes, although high concentrations still occur in some local embayments, and in Lake Erie • Phosphorus loads have decreased due to changes in agricultural practices and improvements in sewage treatment • Average concentrations in open waters of Lakes Superior, Michigan, Huron and Ontario are at or below target levels
	Contaminants in Snapping Turtle Eggs	• To assess the sensitivity of wildlife species to contaminants	▭	• Snapping turtle eggs with the highest contaminant levels also show the poorest developmental success • Contaminant levels decreased in snapping turtle eggs from 1984 to 1999, except for two Lake Ontario sites, Cootes Paradise and Lynde Creek
	Contaminants Affecting Productivity of Bald Eagles	• To assess the potential harm to wildlife eating contaminated prey, and to assess the success rates of nesting attempts and the number of developmental deformities in young bald eagles	➡	• Concentrations of organochlorine chemicals are decreasing or stable but still above No Observable Adverse Effect Concentrations (NOAECs) for the primary organic contaminants DDE and PCBs • The number of bald eagle territories has increased markedly from the population decline caused by DDE • The percentage of nests producing one or more fledglings and the number of young produced per territory have risen • Established territories in most areas are now producing one or more young per territory indicating that the population is healthy and capable of increasing; recently, an active territory was also reported from Lake Ontario
US EPA	Non-Native Species	• Reporting non-native species introductions into the Great Lakes ecosystem will highlight the need for more effective safeguards to prevent the introduction and establishment of new non-native species	✗	• Since the 1830s, there have been 63 non-native aquatic animal (fauna) species introduced into the Great Lakes • In almost the same time frame there have been 83 non-native aquatic plant species (flora) introduced into the Great Lakes ecosystem • Ship ballast water is the major vector transporting unwanted organisms into the Great Lakes
	Contaminants in Whole Fish	• Great Lakes waters should be free of toxic substances that are harmful to fish and wildlife populations and the consumers of these biota	➡	• Since the late 1970's levels of historically regulated contaminants in such as PCBs, DDT and Hg have generally declined in most fish species monitored
Human Responses/ Activities	Mass Transportation	• To promote sustainable development by increasing public transit use, to decrease pollution emissions and energy consumption	▭	• The observed trend from transit authorities in Ontario from 1993-2000 shows an increase in public transit ridership in established urban areas in Southern Ontario, but the converse for rural areas of Northern Ontario • Visible increase in ridership for transit agencies serving inter-regional areas • Public transit ridership increases with increased urban density • U.S. public transit ridership has remained relatively constant from 1996 to 2000, with Chicago having the largest percent of transit use
	Water Use	• To promote sustainable development, by advocating resource conservation specifically to reduce the amount of water used and the amount of wastewater generated in the Great Lakes basin	▭	• Per capita municipal water use in Canadian municipalities has decreased by 15% from 1983-1999, while as the US per capita use has increased by 10% from 1985-1995 • By category hydroelectric use continues to be the largest, residential, commercial and industrial water use increased by ~50% in the Canadian side of the Great Lakes basin from 1983-1999
OK Department of Environment, Transport and Regions	Solid Waste Generation	• In order to promote sustainable development, the amount of solid waste generated, which provides a measure of the inefficiency of human land based activities, needs to be reduced	➡	• In Ontario the per capita municipal solid waste generation (MSWG) has decreased ~45% from 1991 to 2001 • MSWG in Minnesota has increased by ~10% from 1994 to 2000 • At the same time the amount of residential recycling in Ontario has increased 41% from 1992-2000

Question for Mr. Chris Jones
Ohio Environmental Protection Agency Director
for the Council of Great Lakes Governors

Q. As I stated during the hearing, I think indicators for all of the Great Lakes are a very important piece to protecting and restoring them. However, until we get this done, we need to a least continue the work we started in 1998 with the release of the Lake Erie Water Quality Index. What monitoring are we doing? When will the Index be updated? What do you expect will be the results—for example, has Lake Erie improved since 1998?

As you know, I recently wrote the Council of Great Lakes Governors urging them to take the lead in developing a comprehensive restoration plan for the Great Lakes and to complete their work on the Annex by the established deadline of June 2004. When can we expect to receive the Council's priorities for restoration? Does the Council expect to make the deadline for the Annex?

A. The Council hopes to make draft priorities available for public comment this September. The Water Management Prospect is on schedule to meet the three-year timeline in the Annex.

○