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THE GREAT LAKES WATER QUALITY AGREEMENT: ITS PAST SUCCESSES AND UNCERTAIN FUTURE

by

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A Project Sponsored by
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Lee Botts has been an environmental advocate inside and outside government since the 1960s. In 1970, she founded the Lake Michigan Federation, a four-state regional coalition. After working for the U.S. Environmental Protection Agency in Chicago in the mid-1970s, she was named chairman of the Great Lakes Basin Commission by President Carter in 1978. When the regional planning agency was abolished by the Reagan administration, she became a research associate from 1981 to 1986 at the Center for Urban Affairs and Policy Research at Northwestern University. There she served as co-chairman of the Third Interuniversity Seminar for the Great Lakes, was a consultant to the National Research Council for a study by the National Academy of Sciences and the Royal Society of Canada of toxic contamination, helped organize the binational coalition Great Lakes United, and was principal U.S. author of *An Atlas of Great Lakes Resources* published by USEPA and Environment Canada. Today, she continues to work on Great Lakes and other environmental issues in the Indiana dunes where her house overlooks Lake Michigan. She is a graduate of Oklahoma State University and in 1993 received an honorary doctorate from Indiana University. She has four adult children and one grandchild.

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Paul Muldoon is a staff lawyer at the Canadian Environmental Law Association (CELA) in Toronto, Ontario. Prior to joining CELA in early 1994, he practised law representing environmental and other public interest groups on a variety of matters.

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Paul Muldoon has a Masters of Arts degree from McMaster University and a Masters of Law degree from McGill University. He completed his undergraduate law degree at the University of Ottawa.

He has sat on various advisory boards, such as the Science Advisory Board to the International Joint Commission from 1990 to 1995 and the former MISA Advisory Board from 1989 to 1995. He was a member of the Environmental Bill of Rights Task Force. Presently, he is on the CCME National Advisory Group to the proposed Environmental Harmonization Accord.

PREFACE

The past twenty years have seen an unprecedented expansion of international cooperation in environmental management. By now, hundreds of multilateral environmental agreements between governments and thousands of bilateral ones, together with an indeterminate number of private arrangements, form a dense network of regimes designed to provide the essential international cooperation without which neither communities nor countries can achieve their environmental objectives.

These environmental regimes have been created by a cast of thousands: officials from local, regional, and national governments, international civil servants, scientists, representatives of business and environmental organizations, and the media have worked together in a pragmatic manner utilizing traditional tools of international cooperation and creating new ones where necessary. Those active in these regimes and those with a scholarly interest in international regimes alike are increasingly asking whether this extraordinary effort has made any difference; in other words, whether the new regimes are effective.

It turns out that this is not an easy question to answer. There is no obvious test that can be applied to determine the effectiveness of international environmental regimes. Changes in the natural environment may have occurred but it is generally impossible to attribute them to single causes, such as the existence of a regime. Regimes may have changed the behavior of people but it is generally difficult to attribute specific environmental consequences to such changes. There is consequently no obvious research strategy that can be applied to this question.

Even when there is general agreement among participants that regimes have been effective, there can be widely different views on the dimensions of effectiveness and its causes. Yet, as we go about adjusting some existing regimes that are judged to be effective and working to improve others, it is vital to know what the critical dimensions of effectiveness are. It is not surprising that much research is currently being conducted on the effectiveness of international environmental regimes and that many jurisdictions are seeking unambiguous answers in assessing the value of past efforts and the need for further efforts.

The Great Lakes water quality regime was one of the earliest international regimes addressing issues of water quality. It was established by the Great Lakes Water Quality Agreement in 1972, the year of the UN Conference on Man and the Environment in Stockholm, of the Oslo Convention for the North Sea, and the London Dumping Convention. It involves only two countries, but since it is concerned with the largest body of fresh water in the world, it actually involves many jurisdictions and affects the interests of a large number of actors within those jurisdictions.

The present report assesses the effectiveness of the Great Lakes water quality regime. At its heart are more than fifty extended interviews with key participants in the regime. Between them, the authors of the report themselves participated in the development of the regime over its entire history. They bring to bear their own experience and perspective, the information from their interviews, an intimate knowledge of the relevant literature, and the access to key documents provided by the open system of government in the United States. No comparable report exists looking at the Great Lakes or any other international environmental regime. The report identifies a number of important factors that have contributed to the widely perceived success of the Great Lakes water quality regime. It also documents some of the continuing differences of perception and the persistent tensions surrounding some of the more complex and controversial issues that affect many key actors, industry in particular. While the report's conclusions are rooted in the underlying research, they do not represent a consensus of those who participated, either as interviewees or in the Advisory Group of the project. In particular, industry representatives remain unwilling to subscribe to the report's conclusions (or its process) without

reservations, and this should be kept in mind. Nevertheless, the report represents a unique contribution to our understanding of international environmental regimes.

This report could not have been written without the support of many individuals and institutions. Jean Hennessey, former IJC Commissioner, was a driving force in launching the project. The Canadian Environmental Law Association provided support for Paul Muldoon to work on this project. Dartmouth College provided institutional support. We thank the Joyce Foundation, the Gund Foundation, the Stewart Mott Foundation, the Laidlaw Foundation, the United States Environmental Protection Agency, and the Embassy of Canada in the United States for their financial support. Many persons agreed to be interviewed for this project, sometimes involving several hours of questions and answers. The information they provided forms the essential basis for this report. John Jackson, Glenda Daniels, Marcia Valiante, Neely Law, and Paul Botts prepared valuable background.

The International Joint Commission met with the authors, as did the Binational Executive Committee. Meetings were convened with representatives of major stakeholder groups, including Great Lakes United, the Council of Great Lakes Industries, and the International Association of Great Lakes Researchers. Jim Bredin, Allegra Cangellosi, Jim Chandler, Hilary Cleveland, Glenda Daniel, Jane Elder, Gary Gallon, Jean Hennessey, John Jackson, George Kuper, Ann McCabe, Joyce McClean, Dale Phenecie, Henry Regier, Marcia Valiante, and Jack Weinberg served on an Advisory Group that held a preliminary meeting in Chicago on July 22, 1995 and a full meeting in Detroit on August 23, 1996. None of these individuals or their organizations have directly or indirectly endorsed this report, which remains the responsibility of the authors and project staff.

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PART 1. INTRODUCTION

Covering about one-third of the border between Canada and the United States, the five Great Lakes and their connecting channels contain approximately 20 percent of the fresh surface water on earth and 95 percent of the fresh surface water in North America. The nearly 300,000 square mile drainage basin is home to one-fifth the human population of Canada and one-seventh that of the United States.

From Lake Superior in the west, through Lakes Michigan, Huron, Erie, and Ontario, only about 1 percent of the water in the lakes flows out each year through the St. Lawrence River to the Atlantic Ocean. The long retention time, the narrow outlet, and the huge surface area of the lakes make this virtually closed system a sink for toxic contaminants and other pollutants. The sources of pollution include several large urban industrial, agricultural, and forestry areas within the watershed as well as lands far outside the basin from which pesticides and other contaminants are transported to the lakes through the atmosphere.[1]

Through the nineteenth century, like the other vast resources of North America, the Great Lakes seemed limitless and inexhaustible. Water guided settlement in the region and provided the basis for development of a vast agricultural-industrial economy. Today, the Great Lakes basin provides 11 percent of total employment and 15 percent of manufacturing jobs in Canada and the United States.[2]

The consequences of industrialization and urbanization became obvious by the mid-twentieth century. By then, the decay of algae blooms was followed by anoxia in Lake Erie; sturgeon, certain pike, herring, and other species had become extinct or nearly so; and the invading sea lamprey had virtually eradicated the prized lake trout as the top predator. In both countries, vast natural forests and wetlands had given way to cities and farmlands. Many beaches were closed because of bacteria in the lower lakes and iron mine tailings turned Lake Superior red for miles along the shore.

Essentially, the Great Lakes Water Quality Agreement (GLWQA) recognized that these huge bodies of water had limited capacity to assimilate human pollution and abuse after all.[3] This binational accord is one of a growing number of treaties, conventions, and agreements that respond to the environmental degradation of natural resources across boundaries between nations.

Now nearly 25 years old, the Agreement is an executive arrangement under the 1909 Boundary Waters Treaty of Canada and the United States.[4] The Treaty created a peaceable system for resolving problems and avoiding disputes for any of the waterways that cross the 5,000 mile border. The processes prescribed by the Treaty are carried out by a binational agency, the International Joint Commission (IJC) of Canada and the United States.

The problems that inspired the Treaty in 1909 related primarily to water use and water quantity. The GLWQA first aimed to improve water quality, but later its overall intent evolved to include the maintenance of ecological integrity of the largest freshwater system on the globe. First signed in 1972, the Agreement was revised in 1978 with expansion of its purpose and new specific objectives.[5] A new Protocol in 1987 retained the earlier objectives but added new annexes and modified the implementation roles of the parties. Since then, additional changes in the role of the IJC and its internal operations have come about. The next review of the Agreement's objectives and terms is due in 1999.[6]

Like the Boundary Waters Treaty, the Great Lakes Agreement has inspired discussion and interest in its interpretation and implementation throughout its history. The framers of the international agreements for the Baltic and the Mediterranean seas considered its features. More recently, it has helped inspire new agreements for Peipsi Lake between Russia and Estonia, and for Lake Baikal, whose watershed extends into Mongolia, Russia, and the Autonomous Republic of Buryat.

Although some regard the Agreement as a model management regime, others consider that it has made only moderate progress toward achievement of its objectives and has failed to overcome resistance to shaping national programs for international purposes. In another view, failures to achieve stated objectives can be attributed to inadequate mechanisms for holding the parties to the Agreement accountable for lack of progress.

Today, anglers again flock to Lake Erie, the lake that gained fame for being "dead." There is little visible pollution in any of the lakes, and loadings of certain toxic contaminants have declined. However, certain fish from the lakes are considered unsafe to eat in every Great Lakes state and province because of accumulations of toxic contaminants, and invasions of exotic species pose new threats to ecosystem stability and biodiversity. Moreover, government expenditures for environmental protection, including programs important to meet the commitments of the Agreement, are declining in these times of budget deficits and fiscal conservatism on both sides of the border.

1.1 Purpose and Objectives of the Report

This report reviews the formulation and evolution of the Great Lakes Agreement to date and considers changes in circumstances that may affect its future. The report has three principal objectives:

1. To examine whether and how the Agreement has furthered cleanup and protection of the Great Lakes ecosystem;
2. To consider means to enhance its effectiveness; and
3. To provide information about the Great Lakes experience with that may assist development of environmental governance arrangements across international boundaries elsewhere.

The definition of a "regime" and how "effectiveness" of a regime can be assessed are discussed below. Evaluation must consider tangible environmental improvements and changes to laws and policies governing the regime as well as less tangible results such as contributions to scientific knowledge, innovative environmental management concepts, and the development of a public constituency in support of the regime.

Although the Great Lakes Agreement has come to be the most important item on the agenda of the IJC, this report is not a study of the IJC. It is concerned with the Water Quality Agreement rather than with other functions of the IJC under the Treaty and with the role of the governments and nongovernmental participants in the Great Lakes regime.

Both the Treaty and the GLWQA exist in a broader legal and political context that reflects Canadian concern about Canada's position in relation to its more powerful neighbor and the lack of sensitivity for that concern in the U.S. Some participants on the U.S. side also fail to appreciate how the arrangement respects national sovereignty by giving both parties equal responsibility for results under their own laws in their own ways. Americans generally do not understand the differences of the parliamentary system and of the distribution of power between the federal government and the provinces from the U.S. system and how those differences affect implementation of the Agreement.

The parliamentary system eliminates the dynamic interaction between Congress, the Administration, and the courts that is so characteristic of the United States. The Canadian constitution gives the federal government relatively less power for environmental protection, so that the Canadian federal government must depend on the provinces, primarily Ontario, to fulfill its responsibilities under the Agreement.

On their side, few Canadians understand the checks and balances of the U.S. system that give Congress an independent role and make the U.S. government depend on the Great Lakes states to meet many Agreement obligations in spite of the greater federal authority. One of the critical questions for the future of the Agreement concerns the effects of the increased devolution of authority to both provinces and states by the central governments.

In addition to equality of obligations, other important features of the Agreement are its grounding in scientific study of the causes of change in the state of the lakes; flexibility that

assumes a long term rather then short term effort for protection of the ecosystem; accountability for results; and a high level of public participation that has resulted in development of a powerful binational community.

This report concludes that the binational community, which has developed in spite of political and cultural differences and which uses the Agreement as a forum for advocating Great Lakes protection, has been essential to the effectiveness of the Agreement to date and to maintaining political support for its implementation. It includes national, regional, and local environmental organizations, industry, researchers, and other nonstate actors, and officials at every level of government who share information and commitment to its goals.

As the Agreement approaches its 25th anniversary, this report finds that the process of implementation has many shortcomings and that difficult and daunting problems remain for the Great Lakes. Yet, the report responds in the affirmative to the question: Are the Great Lakes and the Great Lakes ecosystem better off now with the Agreement than they would have been without it?

1.2 The Methodological Framework

In current studies of international governance, bilateral or multilateral agreements among states that require national or domestic actions in accordance with accepted rules or values are referred to as "regimes."[7] This usage is different from the traditional labeling of a period of history dominated by a pre-eminent political power as, for example, the Trudeau or Reagan regime. Regimes consist of both institutions and organizations. Political scientist Oran Young, whose criteria for evaluating effectiveness of international regimes are used in this study, defines institutions as the "sets of rules of the game or codes of conduct that serve to define social practice."[8] Institutions of a regime reflect the policy, economics, and behavioral culture of the relationship between the states, including the balance of power that sets up expectations about behavior. The parliamentary system in Canada or the doctrine of separation of powers in the United States are important institutions.

Organizations, on the other hand, are the "material entities possessing offices, personnel, budgets, equipment and, more often than not, legal personality" whose activities are governed by institutions.[9] Functions of organizations may include gathering information, monitoring compliance, or resolving disputes. Organizations may also seek to influence policy. The Canadian Parliament and the U.S. Congress are organizations. The IJC, established by the 1909 Treaty, is a binational organization within the Great Lakes regime that has all the attributions listed above.

Evaluation of the "effectiveness" of the Water Quality Agreement is complicated by the difficulty of demonstrating the extent to which any environmental improvements that have occurred are due to the existence of the binational regime as compared to contemporary regulatory actions and policies. Results can be quantified only for a specific objective such as a numerical effluent limit. Conclusions about success in reaching a less objective goals, such as applying an ecosystem approach to management, are necessarily more subjective. Part of the difficulty is how to define effectiveness.

Is effectiveness simply a measure of environmental change, or could new and revealing scientific discoveries from research associated with a regime also be considered a measure of success? Can the evolution of a new kind of policy or legal response be another indicator? Is a regime successful if it provides a forum and a focus for actions by a transnational community on behalf of a shared resource? Can success also be measured by provision for accountability of results and flexibility that allows adaptation to changing conditions?

The characteristics of the Great Lakes regime that account for its effectiveness in this review are discussed in Part 4. The experience under the Great Lakes Agreement is also examined with the methodology proposed by Young.

The three main sources described below have been used in researching the history of experience under the Great Lakes Agreement. The authors also draw upon their personal

experience working for and with nongovernmental organizations, in working within government, and in participating directly in IJC bodies and activities related to the GLWQA. Together, their direct involvement covers the entire history of the Agreement.

Interviews: The primary source is a series of interviews and consultations, some requested to be confidential, with approximately 100 persons who have been or are still directly involved in implementation of the GLWQA. Persons from government, academia and research institutions, industry, and nongovernmental environmental organizations were interviewed. An outline of the purpose and scope of the project was provided but most interviews covered the experience of the person interviewed. The interview outline and names of persons interviewed are shown in Appendix 1.

Commissioned Research: Several papers and research reports were commissioned. A symposium on "The Role of Science in the Great Lakes Water Quality Agreement," sponsored by the project at the annual meeting of the International Association of Great Lakes Research (IAGLR) in East Lansing, Michigan, on May 28, 1995, provided additional discussion. Papers and reports that assist this project are listed in Appendix 2.

Primary and Secondary Literature: The project also relies heavily on the extensive literature on the GLWQA and the IJC, including previous reviews of the Agreement, the literature on international environmental governance, and the many reports and studies that have been published for Agreement purposes. They are referenced in the text or listed as additional sources.

1.3 Overview of the Report

The report has seven parts. Part 1 is an introduction that describes the background and origin of the Great Lakes Water Quality Agreement. Part 2 discusses the purpose of the study and its methodology. Part 3 describes the evolution of the Great Lakes Agreement in three stages that correspond to the versions of the Agreement to date: (1) 1972 to 1978 under the original Agreement; (2) 1978 to 1987 under the 1978 revision; and (3) 1987 to the present with the addition of the 1987 Protocol, plus discussion of current trends that may affect the future. Part 4 evaluates experience under the Agreement and identifies successes and failures in implementation. Both the essential characteristics of the Great Lakes regime and Young's criteria are used to assess its effectiveness.

Three further sections seek to draw out conclusions from this analysis. Part 5 considers factors that may affect the future of the Great Lakes Agreement. Part 6 offers recommendations for improving its effectiveness. Finally, the annex discusses experience elsewhere in governance of international waters.

PART 2: BACKGROUND AND HISTORY OF THE GREAT LAKES WATER QUALITY AGREEMENT

2.1 Sharing Waters Across the Border: The Boundary Waters Treaty

The Boundary Waters Treaty of 1909 originated primarily out of concern over apportionment of water for producing hydropower around the turn of the century.[10] The Treaty established the International Joint Commission (IJC) as an organization designed to resolve disputes and to avoid conflicts that "would inevitably arise between two sovereignties sharing both a continent and a frontier of continental dimensions."[11]

The IJC has several functions. First, using what is sometimes called its quasi-judicial power to apply governing principles for water use, the IJC decides whether to approve construction or other actions that will affect the levels and flows of boundary and

transboundary waters. The governing principles are also used by the IJC for limited control of water levels in Lake Superior, Lake Ontario, and Lake Erie by operation of locks and control structures. Second, when requested by both governments in what is called a reference, the IJC investigates specific situations and makes recommendations to the governments on how to address problems. The third function of the IJC is its arbitral power to resolve disputes under Article 10, although its relevance is limited since it has never been used.[12] On the other hand, the IJC is given credit for dispute avoidance.[13]

The emphasis on binational processes and equal sharing of responsibilities in the Boundary Waters Treaty reflects the United States' acknowledgment that its manifest destiny would not after all extend north and Canada's willingness to overcome its fear of domination enough to participate in a joint institution. By design, the IJC ". . . has made equals of two very disparate nations . . . through the theory of equality on the Commission and equality on the boards in the field . . . Size did not matter."[14]

Article 4 of the Treaty anticipated concern about water quality with a provision that neither party should cause pollution that would injure the health or property of the other side. Over three-fourths of the cases before 1944 concerned applications for "Orders of Approval" under Article 8. The remainder were references, or requests from the governments to the IJC for investigations of issues, including pollution, under Article 9.[15] Prompted by concern about waterborne disease, an investigation on water pollution began in 1912 but the governments did not act on the IJC's resulting recommendations submitted in 1919.[16]

Former Canadian Chairman Maxwell Cohen called the period from World War II to the early 1960s the "Great Works period," when locks and dams in the St. Lawrence Seaway and the Columbia River systems were developed.[17] Since the early 1960s, most attention has been given to air and water pollution problems in what is generally agreed to be "the environmental era," during which even issues of levels and flows have been addressed from new perspectives.[18]

In 1972, the Great Lakes Water Quality Agreement created a special regime, linked to the Boundary Waters Treaty, with the goal of cleanup and protection of all the lakes. The executive Agreement is considered to be a standing reference under the Boundary Waters Treaty but could be terminated by either side with one year's notice. One commentator views the GLWQA as an extension of the Boundary Waters Treaty. He suggests that the Agreement "breathes life" into Article 4 of the Treaty.[19]

In effect, it sets out what is meant by "pollution." As the GLWQA regime evolved and expanded with substantial revision to the Agreement in 1978 and a 1987 Protocol, new institutions were created to implement the Agreement, in accordance with the IJC's established practices, as the parties, or governments, also developed new programs for implementation.

2.2 Responsibilities of the Parties

The parties to the Great Lakes Agreement are the federal governments of Canada and the United States and, by extension, all the other governmental jurisdictions within the Great Lakes basin. By signing the agreement, the governments accepted the primary responsibility for achieving the objectives of the Agreement, a point that is self evident but has been subject to confusion by the members of the public who think that the International Joint Commission has the primary authority for implementation.

In actuality, the primary responsibility for programs to achieve the objectives of the Agreement rests with the two principal federal environmental agencies for the governments, Environment Canada and the U.S. Environmental Protection Agency (USEPA). This is why in day to day activities, these two agencies are often referred to as "the parties" when they are really the lead agencies for the governments who are the true parties to this historic agreement. This report attempts to distinguish between the governments as the parties to the Agreement and the lead agencies.

The primary role of the IJC is to oversee the process as an independent binational agency. The presence of such an agency is a unique feature of the Great Lakes Water Quality Agreement. Much of the history of the Agreement is concerned with how the role of the IJC strengthens the Agreement and sometimes creates confusion and conflict.

2.3 Structure and Operations of the IJC

The binational character that is the chief feature of all activity under the Treaty extends to the IJC and all its institutions. The IJC itself has six members, three from each side. Although each side or section has its own secretariat and a small permanent administrative staff in the national capitols in Washington and Ottawa, the Commission is considered independent of the governments. Most decisions have been reached by consensus and, throughout its history, the governments have accepted and acted on most recommendations of the Commission.

As an independent agency, each section consults formally with its own government through its respective foreign policy agency: the Department of State in the U.S. and the Department of External Affairs in Canada. The secretariats communicate and work together directly on day to day matters.

For technical information and policy advice in conducting investigations, the IJC has depended mainly on boards or special committees with equal membership from each country. The members are mainly staff of government agencies with appropriate authority and expertise who carry out their responsibilities for the IJC in addition to their regular duties.[20] Under the Great Lakes Agreement, membership has often been extended to nongovernmental experts, including representatives of environmental organizations and industry.[21]

Permanent boards for various parts of the Great Lakes hydrologic system advise the IJC as needed on operation of the control structures that affect levels and flows. Special temporary study boards are established for references to carry out "fact-finding" investigations and to advise the IJC about appropriate recommendations to the governments. The Agreement calls for several ongoing advisory boards that are required to make periodic reports with recommendations to the IJC. They can also make special reports as needed.

Operating Principles

To maintain the parity and equality that is the first operating principle of the IJC, the location of meetings is alternated on each side of the border and the costs of joint activities are shared equally. Maxwell Cohen noted that "symmetry in the Commission offsets the political asymmetry resulting from differences in sheer size between Canada and the U.S."[22] A second operating principle is that the IJC has been expected to work free from nationalistic considerations and to seek the best solution to common problems based objectively on results of joint fact-finding studies. Independence from consideration of national interest is not explicitly required in the Treaty, which allows separate reports to the governments if the Commission is unable to reach consensus.[23]

The tradition of binationalism dates from the first meeting of the IJC in 1911, when U.S. co-chair J.A. Tawney declared that, "as members of this Commission, we are therefore, neither Canadians nor Americans, but we are each and all representatives of all the people on both sides of our International Boundary line."[24] A later U.S. Commissioner, Charles Ross, echoed this sentiment after the Great Lakes Agreement was signed. He said that, with rare exceptions, the Commission has acted "as members of a single body" with independence from U.S. or Canadian government interference even though appointed by the heads of the governments of each country.[25] According to Ross, the "singleness" in operation fostered development of an "esprit de corps" among the IJC members and their staffs and the hundreds of public servants and other experts who serve in its institutions.

This was why, he said, that "to the greatest possible extent, national sovereignty gets lost in the shuffle."[26]

In his 18 years on the Commission under five U.S. presidents, Ross fiercely defended the tradition that no IJC commissioner met with another unless a representative of the other country was also present.[27] Nevertheless, possible conflicts between serving simultaneously as representative of an agency and as an impartial expert, or between loyalty to an administration in return for political appointment remain an issue.[28]

A third operating principle has been reliance on common fact-finding as a viable and effective way to resolve disputes. Use of objective expert advice was cited in a 1975 Canadian Senate report as the basis for the governments' respect for the objectivity of IJC decisions. The report observed that "fundamental to the success of the IJC is the common fact-finding process which de-politicizes each problem and unites both technical staffs in the search for the basic facts of the situation."[29] Another commentator suggested that ". . . without the use of the IJC's unique technical board procedures, neither side would have the confidence in each other's proposals . . ."[30]

A fourth operating principle of detachment and distance from other interested parties is related to the reliance on expert advice. Before the GLWQA, the IJC reported to the governments and, except for public hearings to gather information, generally did not consult with nongovernmental organizations or private parties. Basing its recommendations in part on direct response to the views and wishes of the public and on consultation beyond the advisory boards is a major change in the operation of the IJC in the 1990s.

2.4 Origins of the Great Lakes Water Quality Agreement

IJC activities that led to the 1972 Great Lakes Water Quality Agreement followed the traditional pattern for addressing levels and flow issues: use of binational boards of experts to make recommendations for actions to be taken based on results of fact-finding investigations requested by references from the governments. The Agreement grew directly out of a joint 1964 reference on pollution in Lake Erie and elsewhere in the lower lakes.[31]

A 1950 report to the IJC, on a 1946 reference on growing pollution in the St. Clair, Detroit, St. Mary's, and Niagara Rivers, and Lake St. Clair, had already recommended "urgent action" to set "objectives for boundary water quality control," to establish boards to monitor and report on pollution problems in the connecting channels, and to propose reductions in the discharge of wastes.[32]

In 1970, the IJC said that actions based on this recommendation were "the first of their kind on an international basis" and led to major decreases in daily discharges of phenols, cyanides, oil, and suspended solids. Don Munton identifies these first water quality standards as a policy innovation that anticipated what later became standard features of the pollution abatement programs in both countries.[33]

In 1956, the United States proposed a new reference to investigate pollution of Lake Erie, Lake Ontario, and the St. Lawrence River. After Canada agreed, the U.S. suggested a broader study that would address both water quality and water quantity, because of the growing concern about fluctuations of lake levels. Levels that had been high in the early 1950s declined to historic lows by 1964 and the reference that led directly to the 1972 Agreement was accompanied by a separate reference on levels.[34]

As had been reported for large lakes in Europe, scientists directed by the two advisory boards found that excessive phosphorus was the chief cause of accelerated eutrophication in Lake Erie and Lake Ontario.[35] As field work proceeded, public concern about water pollution was stimulated by the television spectacle of what appeared to be the Cuyahoga River on fire in late 1967 and a reporter's interpretation of the news about eutrophication as meaning that "Lake Erie is dying."[36]

Joseph DePinto and Thomas Young, two of the many scientists involved in the Great Lakes clean-up effort, define eutrophication as "a process by which increases in the population of certain algae, encouraged by the presence of excess phosphorus in a lake,

lead to the depletion of oxygen in the water and the consequent deterioration of the lake."[37] Public demands for action increased as huge windrows of decaying algae piled up on Lake Ontario beaches and a massive alewife dieoff in Lake Michigan in 1967 not only interfered with swimming but threatened public water supplies and caused a secondary dieoff of shorebirds who fed on the dead fishdue to botulism.[38]

Public agitation grew after a 1968 oil spill off Santa Barbara, California, coincided with rumors that oil drilling was to begin in Lake Erie. The IJC responded in 1969 with public hearings on a summary report, followed by the final report in 1970.[39] Recommendations included new water quality objectives and control programs for the lakes themselves, with ongoing authority for the IJC to coordinate, evaluate, and verify the results.

After the governments acknowledged the inconsistency of the pollution problem with Article 4 of the Treaty, a joint working group was formed to negotiate an agreement for Great Lakes cleanup.[40] After six years of study and two years of intense negotiations, the Great Lakes Water Quality Agreement was signed by Prime Minister Pierre Trudeau and President Richard Nixon on April 15, 1972.

2.5 Provisions of the Great Lakes Agreement

Technically a reference, or request from the governments, the Great Lakes accord enlarged the scope of the IJC and added new features to the binational relationship (see Table 1). Before the Agreement, the IJC had advised the governments about specific problems and set orders for limited control by engineering works of levels and flows in Lake Superior, Lake Ontario, and Lake Erie. With the Agreement, the IJC was required to oversee management of a huge biological system inhabited by 40 million people and affected by some of the largest concentrations of urban development in North America and the world.[41]

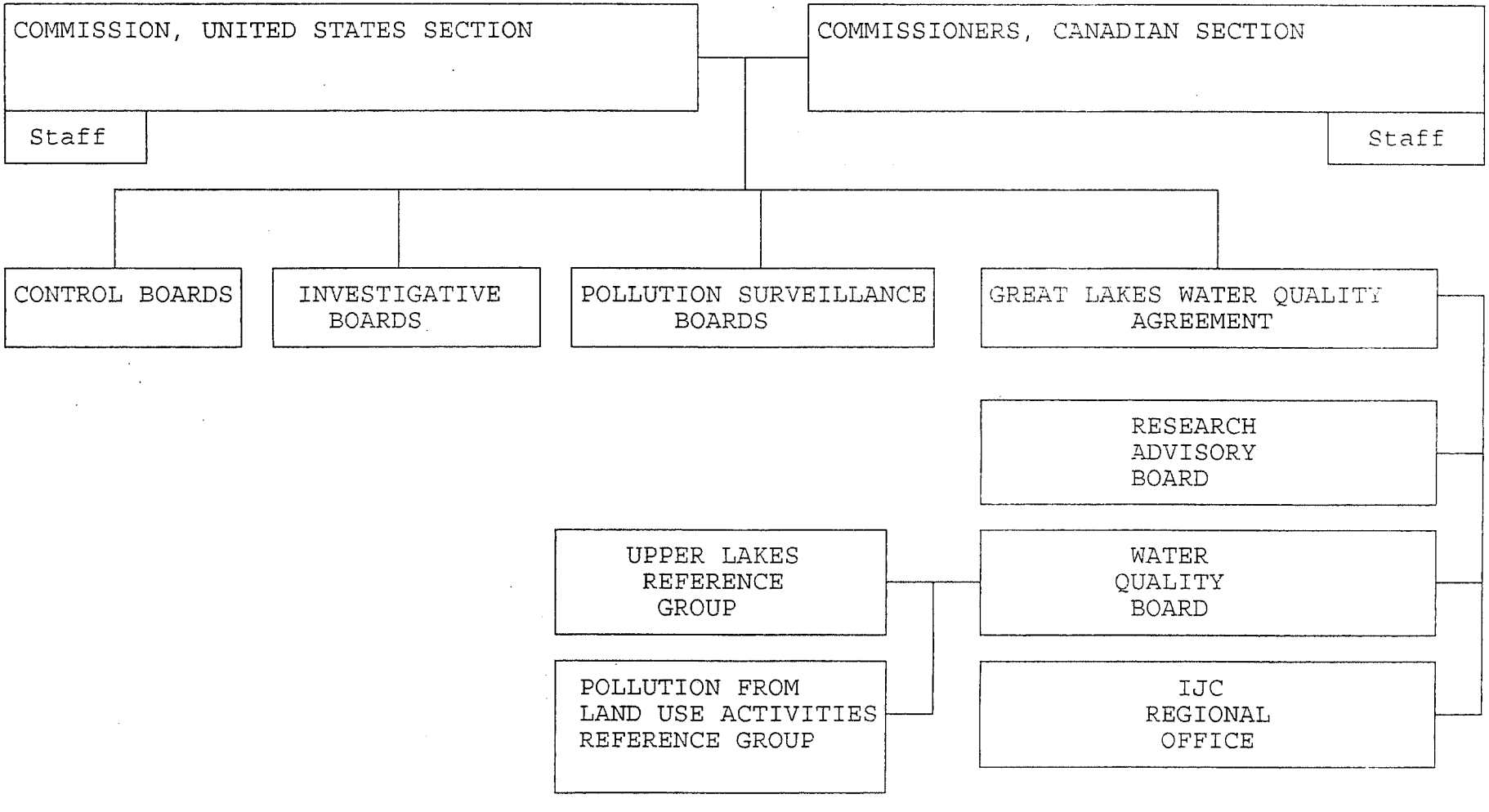
The Agreement was accompanied by two references to the IJC calling for joint investigation of issues that might need further attention. One was a reference on Pollution from Land Use Activities that is generally referred to as PLUARG, the acronym for the Pollution from Land Use Reference Group that ultimately produced more than 100 reports over several years.[42] The second called for investigation of pollution in the Upper Great Lakes (Superior, Huron and Northern Lake Michigan) and was carried out by an Upper Great Lakes Reference Group.[43]

The Agreement retained the binational character of the Boundary Waters Treaty in two ways: in the operation of joint institutions and in allowing each country to achieve the common objectives under its own political system and laws. The Agreement also fostered growth of a binational community by expanding the public information services of the IJC. The hearings held by the IJC on applications for construction of engineering works under the Treaty had generally occurred near a particular location with only local interests represented. The Great Lakes Agreement allowed the IJC to make information available about its progress at any time both to the governments and to the public at large.

A new jointly operated Great Lakes Regional Office was directed to "provide a public information service for the programs."[44] As implementation proceeded, this requirement helped increase direct involvement of citizens with the scientists, government personnel, and industry and other interests who came together in a large and diverse community committed to achieving the objectives of the Agreement. In 1992, Ron Shimizu, formerly with Environment Canada and now an Associate at the Institute of Environmental Studies at the University of Toronto, defined the community in this way:

> . . .we humans who live in the Great Lakes Basin Ecosystem have been developing the basis for a viable Great Lakes Community . . . by which I mean an identifiable bioregionally based society which can be defined in terms of shared values, interests, attitudes and behavior reflected in a set of social institutions.[45]

TABLE 1
IJC ORGANIZATIONAL ARRANGEMENT AND BOARDS
(1974)



Source: Adapted from International Joint Commission, The Annual Report of the International Joint Commission United States-Canada, 1994 (Ottawa-Washington, May 1995), Appendix 1

A requirement for joint monitoring of water quality gave the IJC a new evaluation role and provided accountability between the IJC and the governments, between the governments, and, increasingly over time, directly between the IJC and the citizens of both countries. Much of the debate about the effectiveness of the IJC and the GLWQA over the years has concerned the fact that the binational agency has no powers to enforce its recommendations.[46] Yet, nongovernmental representatives successfully sought changes in the Agreement to increase accountability of the governments for their efforts under the Agreement, creating an indirect avenue of enforcement.[47]

Regular reviews at several-year intervals by the parties of progress under the Agreement provides flexibility to set new objectives that recognize that problems have been solved or that identify new ones.[48] Between reviews of the Agreement itself, the expert boards of advisors report regularly to the IJC, at first annually and now biennially.

In the tradition of the IJC, members of the boards are expected to serve "in their personal and professional capacity" as individuals even when they are appointed because of their position with a specific government agency or research institution.[49] Nevertheless, possible conflicts between serving simultaneously as representative of an agency and as an impartial expert also remain an issue. Most questions about conflict of interest have been raised about members of the Water Quality Board (WQB) and persons who work for industry.[50]

The Water Quality Board

The Agreement directs that the WQB be the principal advisor to the Commission. The official members include heads of provincial and state environmental agencies. With some exceptions, the tradition has been for the director of the Ontario Regional Office of Environment Canada and the administrator of Region 5 of the U.S. Environmental Protection Agency (USEPA) to serve as co-chairs. To date, the WQB has not had any nongovernmental members.

The USEPA and Environment Canada are considered the lead agencies for the two governments as parties to the Agreement, often being deferred to even by the foreign relations agencies.[51] In recent years, however, actual participation on the WQB has increasingly been delegated to lower level staff members of the agencies represented.[52]

The Science Advisory Board

In addition to the WQB, the Science Advisory Board (SAB) (called the Research Advisory Board until 1978) advises the IJC on science-related matters under the GLWQA. The SAB includes managers of Great Lakes research programs and other "recognized experts." The membership includes social scientists and representatives of industry and environmental organizations.

Although not called for as a separate board in the text of the Agreement, a third advisory body, the Council of Great Lakes Research Managers, was formed by the IJC in the mid-1980s. The chief functions it performs formerly were carried out by the SAB.

The Biennial Meetings

From 1972 to 1978, the IJC made annual reports on progress. From 1978 onward, the Commission has, with some exceptions, reported every two years.[53] Since 1975, prior to the drafting of its report, the IJC has held a public meeting to receive formal reports from the boards and to discuss the boards' recommendations before it develops its own progress report to the governments. Although members of the audience were allowed only to observe in the earliest meetings, in time presentation of the board reports to the IJC in public meetings became a mechanism for increased public understanding of Great Lakes problems and for citizen activism.[54]

The reports of the IJC to the two governments include recommendations for needed actions. In the 1980s, lack of response by the governments to the IJC reports came to be seen as a reason to demand more accountability of the parties. Language intended to achieve this end was inserted in the 1987 Protocol.[55]

2.6 The Role of the IJC in the Great Lakes Regime

The IJC has two roles in the Great Lakes regime. One role is formal and is required by the terms of the Treaty and the Agreement. The other role may be informal, is sometimes discretionary, and therefore often depends on the personality and initiative of IJC commissioners and staff. Changes in both kinds of roles have occurred since the Agreement was adopted.

The formal role includes the investigatory function under Article 6, which contained two references. One reference called for examination of remedial actions needed for the Upper Great Lakes (Superior and Huron). The second led to establishment of a Pollution from Land Use Activities Reference Group (PLUARG) to investigate pollution from nonpoint sources such as runoff from land.

New required responsibilities for the IJC included collection and verification of water quality data and analysis of the effectiveness of government programs. The Commission was also charged with advising the governments about new problems and solutions to existing problems, as well as coordinating binational activities of the parties, as represented by USEPA and Environment Canada. Finally, the IJC was to assist in coordination of research and to inform the public about water quality.[56]

To help meet these responsibilities, scientific experts were added to the expanded staffs of the IJC offices in Ottawa and Washington. However, most of these activities became the responsibility of the Great Lakes Regional Office called for in Article 7. The office was established with a binational staff in a central location in the watershed, across the river from Detroit in Windsor, Ontario. The office also provides secretariat services to the IJC in its Great Lakes functions, and to the two advisory boards. In time, the office came to manage meetings, reports, and other arrangements for a multiplicity of committees, subcommittees, and task forces as well as the two references. The regional office also coordinates activities with other Great Lakes institutions such as the Great Lakes Fishery Commission and the International Association of Great Lakes Research.[57]

Public information services became a major activity and offered new opportunities for Commission members to interact with the community that grew up around the Agreement. Activities include production and distribution of the IJC newsletter *Focus* and organizing public meetings before the IJC makes its reports to the governments on progress in the Great Lakes. In recent years, commissioners have become more active in initiating new kinds of activities and means of consultation beyond the IJC institutions, often participating directly themselves.[58]

The operations of the IJC had remained relatively stable during the first several decades following the Treaty. By contrast, over the nearly twenty-five years since the Agreement was signed the Commission, the new binational institutions, and the Agreement itself have continued to evolve, just as environmental conditions in the Great Lakes themselves have changed dramatically.

PART 3: EVOLUTION OF THE GREAT LAKES WATER QUALITY AGREEMENT

By and large, experience under the Agreement has evolved in three phases, each with its own character. The first phase was from 1972 to the renegotiation of a new Agreement in 1978. This was a period of commitment and substantial success in reducing the phosphorus loadings that were originally conceived to be the chief threat to Great Lakes

water quality. Discoveries about the presence of toxic contaminants in this period led to fundamental change in objectives for a new agreement.

Some uncertainty remained about the ultimate level of phosphorus reduction needed in the upper lakes when the first review of progress led to a new agreement in 1978, but the public was already celebrating clearer water and the return of better fishing in Lake Erie, less algae in Lake Ontario, and safe beaches on Lake Michigan.[59] By this time, scientists and agency personnel were more concerned about new evidence of extensive toxic contamination from many sources.[60]

The second phase, from 1978 to the addition of a new Protocol in 1987, was dominated by confirmation of the complexity and seriousness of toxic contamination of the ecosystem and by growing public concern—but also confusion and uncertainty—about how this problem could be managed.[61] The 1978 Agreement pioneered the concept of an ecosystem approach President Nixonto management and its fundamental structure and objectives were retained with the addition of a new Protocol in 1987.

The third phase, from 1987 to the present, is still evolving as a period of paradox and major change in relationships between the parties and the IJC and in the operations of the Agreement's institutions. This phase is also marked by further broadening of the community involved in implementation of the Agreement, through Remedial Action Plans (RAPs) in 43 Areas of Concern throughout the basin, a call for Lakewide Management Plans (LAMPS), the much greater involvement of industry, and the changing role of the IJC.

Future uncertainties as discussed in Part 5 include questions about integration of the Water Quality Agreement process with other Great Lakes management arrangements such as the strategic plan of the Great Lakes Fishery Commission, the relationship of the IJC with the new North American Commission for Environmental Cooperation, and how the Agreement will be affected by changing political goals and new fiscal constraints for both countries' governments.

3.1 Phase 1: Evolution of the Agreement from 1972 to 1978

The main aim of the 1972 Great Lakes Water Quality Agreement was to change water chemistry enough to reverse eutrophication. The chief water quality success was the decline of algae growth and other evidence of slowing of eutrophication that followed reductions of phosphorus loadings.[62] Table 1 outlines the basic governmental arrangements in 1974.

Phosphorus inputs were reduced by a mix of measures including improved sewage treatment, adoption of phosphate detergent bans in the U.S. and substantial limitations in Canada, and reductions in agricultural runoff.[63] Limnologist Alfred Beeton has said that, until the international action on chlorofluorocarbons, nowhere else has such an environmental success been achieved for such a large system through cooperation in so many political jurisdictions.[64]

There was also success in substantially eliminating other visible signs of pollution such as floating sewage or debris, fish kills, and floating oil. In less than five years, the public interpreted greater water clarity and return of the walleye to Lake Erie, as well as improved conditions in Lake Ontario and Lake Michigan, to mean that the lake cleanup had been accomplished. Later, it became a cliché to point out that, although visible pollution had declined, the public was initially less concerned about toxic contamination because chemicals such as polychlorinated biphenyls (PCBs) "cannot be tasted, seen or smelled."[65]

The presence of both DDT and PCBs in fatty fish tissues had been discovered before the Agreement was signed.[66] As progress was underway toward the phosphorus reduction objective, research disclosed the bioaccumulation in the food chain of many additional persistent toxic chemicals, especially chlorinated hydrocarbons.[67] These toxic substances were found to be reaching the lakes from many sources, including direct discharges, the atmosphere, and by leaching through groundwater.[68] Scientific understanding of the health

effects for wildlife and humans of toxic contamination in the Great Lakes would come to be considered an early warning to the world.[69]

From the Agreement's first years, its processes provided a forum for interaction and exchange of information among agency staff, scientists, and environmentalists, and an ongoing source of information to the public about the state of the Great Lakes. As the Agreement-related community developed, it maintained and stimulated the political will of the governments for Great Lakes protection, though its various members played different roles in the overall process.

The Lead Federal Agencies for the Parties

The constitutions of both countries reserve the conduct of foreign affairs to the federal governments, usually represented by the U.S. State Department and the Canada Department of External Affairs. Under the Agreement, both departments have deferred to the lead federal environmental agencies, USEPA and Environment Canada, on substantive issues, and the departments' chief role has been to oversee the formal reporting and review requirements and transmittal of federal funds to the IJC.[70] Thus the two federal environmental agencies are actually the lead agencies under the Agreement.

The foreign service agencies forward the Commission's reports on progress to the governments and the governments' responses to the Commission. Another role is to help organize and oversee the periodic review and re-negotiation of the Agreement, first in 1976–1977 and again in 1986–1987, but in both cases they again deferred to Environment Canada and USEPA in the determination of revisions.[71]

One of the key mechanisms for accountability under the Agreement is the annual report (biennial after 1978) by the IJC to the governments. In the early phase, when the lead federal agencies gave priority to the programs and funding needed to pursue Agreement objectives, the governments made little formal response, and that was invariably delayed.[72]

In both countries, the agencies did not wait for the response following the IJC reports to respond to the IJC's recommendations. Instead, members of the Water Quality Board who participated in the deliberations that led up to the recommendations used the IJC's reports to the governments both to lever action from other jurisdictions and as an excuse or rationale for new initiatives by the agencies that they represented. Hence, various programs were furthered, sometimes even before the release of the IJC report, to anticipate the recommendations.[73]

U.S. Environmental Protection Agency. Negotiations for the Water Quality Agreement with Canada were already underway when President Nixon set up the USEPA by executive order of in 1970. The authority for the new agency to take the lead for implementation of the Agreement derives mainly from the Clean Water Act, the law that was first passed as PL 92-500 in 1972.[74]

After it was signed, the Washington headquarters of USEPA tended to consider obligations under the Great Lakes Agreement with Canada an interference with the agency's policy to give priority to national rather than regional issues. Day-to-day liaison with the IJC was left to the Office of International Activities in Washington and the Region 5 office in Chicago took the lead in meeting U.S. Agreement obligations.[75]

During the first years of the Agreement, continuing bi-partisan Congressional oversight was needed to designate special funding for the Great Lakes, because of the view in Washington that the domestic law took precedence over the international commitment.[76] Members from Great Lakes states cited Agreement obligations in objecting to President Nixon's impoundment of Congressional appropriations for federal grants to local communities.[77] They also requested studies by the General Accounting Office, held hearings, and sponsored new legislative initiatives.[78] By the mid-1970s, USEPA routinely

limited budget requests for Great Lakes purposes knowing that Congress would restore and even increase total agency funding in order to provide for Great Lakes programs.[79]

The Region 5 Administrator, Francis Mayo, became the first U.S. co-chair of the WQB.[80] He set up an Office of Great Lakes Coordination to integrate the Great Lakes programs into agency programs under the legislative mandates for the various environmental media such as air and water.[81] His successor, George Alexander, says that Congressional support was the reason he was able to convince USEPA headquarters in 1976 to establish the Great Lakes National Program Office (GLNPO) in Region 5 with its own line item in the agency budget.[82]

One of the headquarters' arguments was that the Agreement objective of a 1 mg per liter effluent limit for phosphorus from large sources violated the U.S. Clean Water Act's ultimate goal of making all the waters of the country "fishable and swimmable" by 1983, with no discharge of pollutants after 1985.[83] Nevertheless, the law served Agreement objectives by providing federal grants to local governments for improved sewage treatment and by requiring permits with effluent limits for industrial discharges. Authority for issuance of the permits is delegated to state governments that meet federal requirements and federal grants are provided to assist their Agreement-related programs.[84]

Authority for setting and enforcing water quality standards was also delegated to the states, which could and sometimes did adopt standards stricter than the required national minimum. In the 1990s, consistency of state standards with objectives of the Agreement would be one of the issues that led to development of the Great Lakes Water Quality Initiative (as discussed below in Phase 3).

In addition to the funding designated by Congress specifically for the Great Lakes, funding to meet Agreement obligations was provided in two other ways in this early period. First, the Region 5 office of USEPA used funds from other programs to support its Great Lakes office and the binational activities directly related to implementation of the Agreement.[85] Second, appropriations for water programs such as sewage control were counted as Great Lakes expenditures when they were made within the Great Lakes basin.[86]

Thomas Jorling, EPA Assistant Administrator for Water, raised issues in the 1977 five-year review of the first Agreement that confirmed Washington's continuing reluctance to accept the Agreement goals. Following the election of President Jimmy Carter in 1976, Jorling had become U.S. chair of the WQB—the first, and to date, the only headquarters official to do so. Although he questioned the Agreement's objectives when a new Agreement was signed in 1978, he seldom attended WQB meetings and the position was returned to Region 5, whose support of the Agreement continued to be backed up by Congress.[87]

From 1972 to 1978, approximately $4.5 billion of U.S. state and federal funds were provided to upgrade sewage treatment under Section 201 of PL 92-500.[88] Funding for research and interagency projects to demonstrate alternative waste treatment technologies was also authorized.[89] Section 108(d) gave $5 million to the Army Corps of Engineers to study nonpoint source control and led to the involvement of the U.S. Department of Agriculture in trials of conservation tillage as a means to reduce phosphorus in fertilizer runoff in Ohio and Indiana.[90] This Great Lakes project was the beginning of the growing national movement for conservation tillage.[91]

Environment Canada. The Canadian federal environment department was established 1971, just prior to the negotiation of the 1972 GLWQA. Its first minister, Jack Davis, used the Great Lakes as one of the first issues to further Canada's international agenda. With the new agreement, Environment Canada inherited a mission for the Great Lakes. Implementation of the Agreement played out differently in Canada than in the U.S. First, the Canadian federal government had already enacted a ban on phosphate in 1970 as a provision in the then-new Canada Water Act. One factor was the confidence of decision-makers, including Joe Green, then Minister of the Energy, Mines, and Resources, in the conclusion of Canadian scientists and the IJC that phosphorus was the limiting, or most

critical, nutrient for eutrophication. Second, there seemed to have been a consensus on the Canadian side that either using a substitute or less phosphate in detergents was acceptable. Third, the provinces were hardly in a position to object to the ban, which would reduce the cost of removing phosphorus for the sewage treatment systems under their jurisdiction.[92] Finally, a good argument could probably be made that Canada also used the ban to gain leverage to convince the U.S. to follow the same course of action.

By the time the 1972 Agreement was signed, Canada had already also negotiated the Canada-Ontario Agreement (COA). Essentially the accord provided that Ontario would implement the obligations set out in the 1972 Agreement if the federal government paid for the needed capital improvements to update the provincial sewage treatment facilities. There was little issue with funding from Environment Canada through the early and mid-1970s. Although the situation began to change toward the end of the 1970s, most of the decade witnessed a prosperous Environment Canada with its National Water Research Institute, housed at the Canadian Centre for Inland Waters, providing the leading, and some have argued the best, research forum for freshwaters at the time.[93]

Then, as today, the Ontario Region remained primarily responsible for the Great Lakes activities. The first director general of the Ontario region, Al Prince, was also the first co-chair of the WQB. He was followed by James Bruce (who then moved to chair the Science Advisory Board) and Robert Slater. As described in the next section, Slater was one of the key negotiators of the 1978 Agreement.

The Role of the States and Provinces

The role of the states under the Agreement reflects their obligation to implement federal policy but lack of responsibility beyond their boundaries. Research for this project has revealed ambivalence and contradictions in the states' role in implementing the Agreement that reflect domestic political changes over time as well as evolution in the joint institutions and binational relationships that it fosters.[94]

Consistent with the U.S. Constitution, the states did not participate directly in the negotiation of the Agreement and later would complain about obligations imposed without their participation. Some states initially wanted Lake Michigan excluded but were overruled after Wisconsin Governor Pat Lucy joined forces with a representative of the Lake Michigan Federation to obtain approval of a resolution recognizing that the Great Lakes form a single connected system.[95]

Initially, no state had special Great Lakes programs or used state funds except to satisfy matching requirements for federal grants for Agreement-related activities.[96] The head of the environmental regulatory agency generally represented each state on the WQB, and staff from the respective water programs or from other agencies served on committees or work groups.

Satisfaction or frustration of the states with the Agreement has been tied to the availability of federal funding. At the same time, state governments have appreciated the collective political power resulting from the regional institutions developing around Agreement processes. Some state officials have also enjoyed the opportunities for interaction on policy with their peers and participation in the expanding community on both sides of the border.[97]

The same officials often met each other on other Great Lakes matters, such as meetings of the Great Lakes Basin Commission or of the advisory board for the Army Corps of Engineers winter navigation project.[98] The growing number of environmental activists who also participated in such events did not distinguish between Agreement and non-Agreement matters; the focus was on the lakes themselves.[99]

Lyman Wible, an official of the Wisconsin Department of Natural Resources and a participant in the WQB in the 1970s and 1980s, observes that, in addition to producing visible and easily measurable water quality improvements, the massive new sewage treatment plants were physical symbols that generated local pride and developed political

capital for the state agencies with an approving public. He also talks about how state officials compared notes on development of the new programs required by federal water law and on provincial policies with their Canadian peers.

However, state objections to what would now be called "unfunded mandates" grew as federal funding for sewage treatment grants was decreased following the 1977 Clean Water Act and more and more problems in the Great Lakes involving persistent synthetic chemicals were being revealed. State dissatisfaction about not being involved is discussed below in the section on the five-year review of the 1972 Agreement.

Ontario. Although in Canada only the federal government can negotiate international agreements on environmental issues, federal-provincial cooperation is required because the provinces have the bulk of legislative authority needed for implementation.[100] The necessary cooperation is often facilitated by bilateral federal-provincial agreements, which was why the COA was developed for the Great Lakes. Signed eight months before the first GLWQA, the COA in effect became the basis for Canada's negotiating position with the U.S. Indeed, the same persons negotiated both Agreements.[101]

The 1971 COA, like those that followed until 1994, as stated in the 1982 COA, were mechanisms to "provide for the cost sharing of specific programs which the province will undertake to assist Canada in meeting" obligations under the Great Lakes Agreement.[102] The $50 million committed in the original COA was mostly dedicated to the upgrading of sewage treatment plants on the Canadian side of the Great Lakes.

In addition to providing a way to get the province to satisfy an international obligation negotiated by the federal government, the first COA provided a considerable degree of harmony in federal and provincial goals and actions for the Great Lakes. Although the federal government provided expertise on the nature of the problem and money to take action, it was agencies like the Ontario Water Resources Commission (which dealt with water quality issues prior to the establishment of the Ministry of the Environment in the early 1970s) that had the expertise to deal with sewage treatment plants and related issues.[103]

Research and Planning Institutions and Programs. USEPA and other agencies also established new institutions for basic research or expanded attention to Great Lakes issues under the 1972 Agreement. USEPA's existing Environmental Research Laboratory in Duluth, Minnesota, carried out some Great Lakes research and its director served as U.S. co-chair of the SAB.[104] A Large Lakes Research Station was established at Grosse Ile, Michigan, explicitly to manage Great Lakes research and to provide technical assistance to GLNPO and the IJC for surveillance, research, modeling, and water quality projections.

Established as part of the National Oceanic and Atmospheric Administration's (NOAA) "Regional Seas" program, the Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor, Michigan, also served Agreement purposes. GLERL staff members continue to serve on IJC boards and committees, and the laboratory helped meet USEPA research needs through interagency agreements and contracts.[105]

Other U.S. federally funded research on Agreement-related issues was carried out at Argonne National Laboratory at Lemont, Illinois, near Chicago, and by the Sea Grant programs operated by NOAA at public universities in six of the eight Great Lake states. The Sea Grant programs included data collection, monitoring, and public education through extension services as well as grants for basic and applied research.[106] University-based research institutions and programs, some pre-existing and some established following adoption of the Agreement, also became involved in the expanded binational process of research and information exchange that followed the signing of the 1972 Agreement. In addition to resources provided by environmental agencies, they could obtain state and federal funds for research and education. Their faculties, staffs, and students joined the emerging Great Lakes community.

Canadian research on Great Lakes issues had been carried out at the Experimental Lakes Program in Manitoba long before the Agreement, and some key scientists then transferred to the Centre for the Great Lakes in the late 1960s. During the mid-1960s, research was conducted through the Inland Waters section of the Department of Energy, Mines, and Resources. The Canadian Centre for Inland Waters (CCIW) was then established in the late 1960s and moved into its new facilities in Burlington, Ontario, in 1972. Environment Canada administered the National Water Research Institute from that location. Dr. Richard Vollenweider was the first head of the Institute, followed by James Bruce. Typically, the head of the Institute also chaired the Science Advisory Board, which included Bruce, Al LeFeuvre, and Keith Rodgers.[107]

CCIW had a relatively modest amount of base funding, which was enhanced for work on the two references to the IJC that accompanied the Agreement. By the late 1970s, the CCIW established regional facilities in Winnipeg and Vancouver, which in turn were combined to form the National Hydrology Research Institute in the early 1980s.

Earlier, increased concern about the fishery and lamprey problems and the reference on phosphorus had led to the establishment of the International Association of Great Lakes Research (IAGLR) in 1967. Now its journal and annual meetings became additional forums for attention to issues associated with the Agreement and for interaction within the broader binational Great Lakes community.

Most IAGLR members are physical or biological scientists. Academic political scientists and other experts in institutional arrangements began their own long-term involvement with the Agreement in 1971 and 1972, with the first of a series of Interuniversity Seminars. The chief organizers were Leonard B. Dworsky of Cornell University and George Francis of the University of Waterloo. Faculty members from 20 other universities in the U.S. and Canada participated in three plenary sessions where institutional arrangements for management of Great Lakes resources were considered. The seminar resulted in a final report endorsed by 24 academic experts in natural resource management.[108]

The chief recommendation called for expanding the authority of the IJC, launching an ongoing discussion about whether Agreement objectives could be achieved without a stronger regional governance arrangement. The final report made specific recommendations that the governments in both countries should begin to consider going beyond the terms of the Agreement to develop "multiple purpose management of the Great Lakes."[109] In May, 1973, a presentation on the recommendations was made to the Subcommittee on Inter-American Affairs of the U.S. House of Representatives Committee on Foreign Affairs.[110] Similar presentations were made to the Standing Committee on Foreign Affairs of the Canadian Senate, in March and December of 1975.[111]

A second Interuniversity Seminar on Improving the Management of the International Great Lakes was convened under the same leadership in 1976–1977. Several individuals who participated in these events have continued their interest and involvement with the Agreement to the present, as academic researchers, as participants in IJC-sponsored activities, and also as advocates with nongovernmental organizations.[112]

Other Regional Institutions. On the U.S. side, the Great Lakes Basin Commission provided another coordinating mechanism for public participation in Agreement-related activities among federal and state agencies. The agency was one of six "river basin commissions" that had been established under the 1965 Federal Water Resources Planning Act to coordinate federal and state policies and planning for development of water resources.[113] Water quality, however, was already the chief Great Lakes issue.

The Basin Commission had eight state and twelve federal members, with the Department of State participating to ensure that the international dimension—effectively Canadian interests—was taken into account. A representative of the Ontario Ministry of the Environment frequently attended basin commission meetings, and staffs of Ontario and federal Canadian agencies participated in workshops and conferences on subjects relevant

to the Great Lakes Agreement. The Commission also provided planning analysis, funded in part by grants and interagency agreements with the USEPA, until it was disbanded by the Reagan administration in 1981. The members of the Public Involvement Work Group established by the Basin Commission included environmentalists who were also active on Agreement matters.[114]

Annual meetings convened by the Basin Commission for the state heads of the Soil Conservation Service in the U.S. Department of Agriculture served as a forum where skeptics about the value of conservation tillage are said to have become advocates.[115] Binational coordination among the U.S. state coastal zone management programs and Canadian shoreline management programs did not directly relate to the Agreement but expanded the Great Lakes community. The binational coordination role was reflected by a publication, whose costs were shared by the U.S. Army Corps of Engineers and Fisheries and Environment Canada, urging use of vegetation to stabilize shorelines as an alternative to engineered structural erosion control measures.[116]

The Great Lakes Commission was a different U.S. regional body that was originally created through an interstate compact. It represented state navigation interests when the St. Lawrence Seaway was built. After the Great Lakes Agreement, the Great Lakes Commission expanded its activities and interests to include water quality and other environmental matters.[117]

Great Lakes Fishery Commission. The Great Lakes Fishery Commission was established in the 1950s primarily to support a binational effort to eradicate the sea lamprey. It later expanded its activities to include coordination of fishery management programs and policies. Although staff and commissioners of the fishery agency participate in the Agreement-related community and now devote much attention to ecosystem management, the IJC and the Fishery Commission still have separate mandates and agendas.[118] The future of the relationship between the efforts of the two binational agencies is one of the issues that needs more attention in the 1990s, as discussed in Part 5.

IJC Joint Institutions and Binational Processes for the Agreement

The Agreement specified that the IJC should establish two ongoing advisory boards plus a Great Lakes Regional Office. Table 1 illustrates the organizational arrangement of the IJC and its boards under the 1972 Agreement.

The International Joint Commission. The 1972 Agreement gave most attention to the ways in which the long-established IJC should "assist in the implementation" of the GLWQA but, as discussed below, not without confusion about which IJC institution should have the lead responsibility for various functions. Article 6 of the GLWQA referenced Article 9 of the Boundary Waters Treaty in giving direction for its several major responsibilities:

1. To collate and analyze data provided by the parties about Great Lakes water quality;
2. To collect, analyze, and distribute information about effectiveness of programs intended to achieve the Agreement's water quality objectives;
3. To advise the parties about water quality problems, with specific recommendations for programs, legislation, or intergovernmental agreements needed to correct them;
4. To assist coordination of joint activities including consultation on "special situations";
5. To assist coordination of research, including advice on research to federal, state, and provincial agencies;
6. To carry out investigations for references from the parties, including the two references attached to the Agreement: the Pollution from Land Use Reference concerning nonpoint source pollution, and the Upper Lakes Reference on pollution problems of Lake Huron and Lake Superior;

7. To make at least an annual report to the federal, state, and provincial governments and to the public about progress toward the Agreement's objectives, including assessment of the effectiveness of programs, with supplemental special reports on water quality problems at any time;
8. To publish reports on its activities under the Agreement at its discretion; and
9. To exercise authority for independent verification of data and information submitted by the parties.

In Article 8, the IJC was given an additional special charge to oversee exchange of information about water quality. Its responsibilities for joint institutions included submission of an annual budget for anticipated Agreement-related expenses to the parties. Most of the expenses to the IJC were related to the operation of the new Regional Office, including the activities of the advisory boards, and to carrying out the two special references on nonpoint source pollution and on pollution of the Upper Lakes.

Great Lakes Regional Office. The Great Lakes Regional Office was established with a binational professional staff. The office serves as a clearing house for Great Lakes data, provides technical support to the IJC secretariat offices in Ottawa and Washington, and itself provides secretariat services to the joint institutions and special projects required by the Agreement. In contrast to explicit Terms of Reference for the Research Advisory Board and directives within the Agreement for how the Water Quality Board would be structured and its members appointed, the 1972 Agreement gave the IJC only broad authority to establish the new office at a site to be determined by consultation with the parties.[119]

Funding arrangements were also vague, with the Agreement providing only that each side would pay half the costs of an annual budget that the IJC would submit.[120] No one disputed that the Regional Office served "in a highly professional manner" in the first stage of its existence, but questions about its authority and relationships with the boards, agencies of the parties, and the IJC itself led to more detailed terms of reference in the second Agreement in 1978.[121]

A 1979 report on a joint study of the regional office observed that "the responsibilities assumed by the Regional Office, as well as tasks assigned, led it to grow . . . over the years without a great deal of outside scrutiny and accountability . . . and there grew . . . some varying interpretations of its functions, capacities, and directions."[122] This report, referred to below, was called for because of questions raised in connection with the negotiation of the revised GLWQA in 1978.

The office opened in March, 1973. The Windsor location was intended to provide easy access across the border. The position of director of the regional office alternated between Canadian and U.S. citizens with two year terms (later expanded to four). A staff of three professional positions grew to 33 by 1979, with expertise that included "urban planning, limnology, physical, organic and analytical chemistry, civil and environmental engineering, statistics, and biology." One primary staff function was secretariat services to the advisory boards, their subcommittees, and working groups, which had nearly 250 members by the end of the first five years.[123] The staff also included a public information specialist and a librarian.[124]

When questions were raised about whether the doctoral degrees of one third of the staff increased costs for an over-qualified staff, the 1979 study found that a high level of technical and scientific expertise was required because of the interaction with expert members of the advisory groups and the high level of competence needed to write the reports.[125]

Independent verification of data provided by the parties or the boards was a more controversial function of the Regional Office because it related to WQB assessment of whether the parties were making adequate effort to achieve the Agreement's objectives.[126] The 1979 study concluded that "there has been no instance where the Regional Office has performed an independent verification function . . . which has proved an embarrassment to [IJC] advisory boards."[127]

The relative functions of the two advisory boards was somewhat uncertain. The Agreement said simply that the Water Quality Board should "assist" the IJC (Article 7, 1). The terms of reference (GLWQA-1972) directed the Research Advisory Board (RAB, later the Science Advisory Board, SAB) "to work at all times in close cooperation with" the WQB, without elaboration on relative authorities.[128] Public information and, increasingly over time, direct involvement of the public in Agreement-related activities, became another major function of the Regional Office for which there was only passing reference in the language of the Agreement. Section 3 of Article 6 called for discretionary reports to the public on water quality problems in addition to the required annual reports to the governments.

As public involvement increased with implementation of the Agreement, the RAB sponsored a workshop to consider methods for public participation.[129] The 1979 study of the the regional office urged the adoption of an explicit policy for the public information function of the regional office because it had become so important.[130]

Water Quality Board. Members of both the advisory boards called for in Article 7 of the Agreement were to be appointed by the IJC "after consultation with the appropriate government or governments concerned." The requirement that the consultation proceed through the foreign affairs agencies on both sides was mainly a formality, as the custom was established that the U.S. co-chair would be the administrator of Region 5 of the USEPA.[131]

The first Canadian co-chair was from the federal Department of Energy, Mines, and Resources and subsequently was the Ontario regional director of Environment Canada. The total membership of directors and other high-level officials of state and provincial agencies was about twenty.

The need to have senior officials serving on the board for "effective development of policy recommendations" was noted in the 1974 report of the Water Quality board to the IJC.[132] At this stage, attendance was good, with an average of fifteen members or "a small number of alternates" at meetings throughout the year.[133]

Increasingly over time, the dual role of serving both as an agency representative and as an individual expert came to be perceived as a built-in conflict of interest for WQB members. The issue was whether staff of an agency could be honest in judging the agency's performance.[134] As noted above, some WQB members used their participation on the WQB to advance their ideas or to prod their own agency. One state member admitted that he criticized his home agency's performance as a member of the WQB, then used the criticism back in his state capitol office to advocate program change.[135] Canadian members expressed similar views.

The cost of participation in IJC activities for state and provincial officials was another ongoing issue. The 1974 WQB report noted that the effort and time that members of the board and its subcommittees spent on IJC activities was in addition to their "normal" work loads in the agencies they represented. The report cited agency warnings that "the assignment of staff and material to [Agreement] work will be constrained due to competition for available budget funds."[136] This warning foreshadowed events a decade later where the IJC took greater charge of the commitment of resources to board activities.

This third annual report also foreshadowed the ongoing question of the Regional Office's role in gathering data on the governments' progress in complying with the Agreement. The report said that it was the responsibility of "the several levels of government" to provide needed data, and urged the IJC to allocate funds to cover agency costs of meeting IJC data needs. The Commission responded that the governments should cover the costs directly.[137] Beginning with this report, a summary volume was supplemented by several appendices with detailed reports from the Water Quality Objectives, Surveillance, and Remedial Programs subcommittees of the WQB.

Research Advisory Board. The broader RAB membership called for in the Terms of Reference was to include not only "appropriate" members from federal, state, and provincial agencies but also from "other agencies, organizations, and institutions involved in Great Lakes research." Membership was to be based primarily on an individual's personal qualifications.[138]

In 1975, the RAB had ten members from each side, plus one ex officio member. The nine standing committees had up to fourteen members each, including private citizens as well as research scientists and agency officials. Many of the members were heads of research agencies or eminent leaders in their fields. For example, the Standing Committee on Eutrophication was headed by R.A. Vollenweider, the scientist credited with helping to identify phosphorus as the limiting nutrient for eutrophication and with setting the stage for the phosphorus reduction efforts fostered by the Agreement. The Committee on Lake Dynamics was headed by Clifford H. Mortimer, director of the University of Wisconsin Centre for Great Lakes Studies at Milwaukee and a leading expert on Great Lakes hydrology.

The RAB generally set its own agenda and often became the forum where new issues were raised.[139] In its 1977 annual report to the IJC, having laid the groundwork in earlier reports, the RAB called for an ecosystem approach to management, a matter discussed in more detail in the next part.[140] In 1979, in discussing long range transport of atmospheric deposition, the RAB called attention to acid rain as a potential threat to ecosystem integrity even though the limestone base of the Great Lakes basin protected the lakes themselves from acidification.[141]

Although travel costs for nongovernmental members of subcommittees and work groups were covered by the IJC, agencies were not compensated for the time or travel of their staff who participated in IJC activities. USEPA and other agency concerns about what they considered undue demand on increasingly scarce resources led to review of the Regional Office in connection with the five-year review of the Agreement, followed by the 1979 internal review by the Commission.

Evolution of Public Involvement

Before 1972, the IJC had held public hearings on specific topics in connection with reference investigations but otherwise conducted its business in private because "internal communications . . . by boards, committees" were only to be made available to the public by permission of the governments.[142] While requiring the IJC to provide public information, the Agreement gave the IJC discretionary authority to issue special reports and to publish any documents (Article 6). Still, over time increasing public involvement in Agreement-related activities became one of its most significant results.[143]

The boards were directed to publicize their meetings and permit members of the public to attend them. All board reports to the IJC have automatically been made public throughout the history of the Great Lakes Agreement. The 1975 workshop of the RAB's Standing Committee on Social Sciences, Economic, and Legal Aspects led to establishment of seventeen public advisory panels throughout the Great Lakes watershed for the PLUARG study.[144] The panels included local elected officials and academic experts as well as environmental activists and representatives of other interests.[145]

The PLUARG public involvement process had three major results with long lasting consequences. First, the widespread involvement of individuals with diverse backgrounds and interests throughout the basin broadened knowledge and support of the Agreement and the IJC. Second, involvement at the local level helped set the stage for the later Remedial Action Plan process. Third, recommendations from the panels included in the final PLUARG report influenced the agenda of the IJC.

Mark Reshkin, chairman of the advisory panel for the Calumet region in Indiana, said the persistence of Elaine Kaplan Beck, a member who had been active locally on air quality issues, was the reason that the panel recommended the identification of atmospheric

deposition, in addition to land runoff, as a nonpoint source of pollution.[146] The attention to atmospheric deposition that began in the Great Lakes Agreement processes led ultimately to the provisions for toxic air contamination in the U.S. 1990 Clean Air Act.[147]

A contract with Great Lakes Tomorrow for pre-hearing educational workshops on the issues addressed by the Upper Lakes Reference Group set another new pattern.[148] As described above, starting in 1975, the annual (later biennial) IJC meetings where the boards presented their reports to the IJC became another forum for ongoing citizen participation. Initially, the audience was allowed only to observe the presentation of board reports and discussion between the boards and IJC commissioners. Later, written questions were submitted during the exchange, and still later special sessions were scheduled to obtain public comments.[149] Initially, the meetings mainly allowed much informal contact for nongovernmental participants with scientists and agency staffs as well as with each other.[150]

News media coverage of the meetings also reminded citizens of both countries at least once a .year of the existence of the Agreement, because the WQB reports were treated as "state of the lakes" reports to the general public.[151] Paul McClennan from Buffalo and a few other reporters became considered members of the community because of their continuing coverage.[152]

Identification by the WQB of "problem areas" (later to be called Areas of Concern) where Agreement objectives were not being met provided a local angle for press releases from the regional office reports.[153] Meanwhile, the Regional Office expanded its public information program to include a quarterly newsletter, *Focus*, and audiovisual materials and brochures describing the IJC and the Agreement, and provided answers to information requests by letter or telephone.[154]

By the mid-1970s, several environmental organizations had established special Great Lakes programs and regularly lobbied on behalf of Agreement-related actions. The Lake Michigan Federation, for example, worked for phosphate detergent bans in Chicago, Indiana, Michigan, and Wisconsin.[155] The League of Women Voters had a Lake Erie Interleague Committee in Ohio and a four-state interleague group for Lake Michigan, and local league members usually covered IJC meetings wherever they occurred.[156]

The Izaak Walton League successfully led the lobbying for the first state phosphate detergent ban by Indiana in 1973 and set up a special four-state Lake Michigan Committee.[157] The National Audubon Society, which has 68 chapters in the Great Lakes region, in the mid-1970s made the Great Lakes a priority issue for its regional office in Dayton, Ohio.[158] The Sierra Club formed a binational Great Lakes Committee of member volunteers to develop policy recommendations to the group's national board of directors and then established a Great Lakes program within its Midwest regional office in Madison, Wisconsin.[159] Later, the Sierra Club was to take the lead in establishing a Great Lakes advocacy presence in Washington, D.C.

The Michigan United Conservation Clubs led the lobbying for a detergent ban in that state. Great Lakes Tomorrow was another binational group that promoted public participation on Agreement issues from a different perspective. Based at Hiram College in Ohio, the group cooperated in carrying out Great Lakes Decisions, the educational program on Lake Erie and Lake Ontario that Elaine Kaplan Beck had first developed for Lake Michigan.[160]

Environmental groups in Canada were neither as large nor as affluent as those in the U.S. for a number of reasons. Obviously, the population base is very different. The Parliamentary system of government in Canada does not lend itself to the lobbying techniques used in the U.S. Although access to the courts has been liberalized in recent years, they are still not as accessible as in the U.S. The Canadian rule that the loser pays the winner's court costs also discourages litigation, and in particular, public interest litigation. Further, many of the now-established groups were just finding their feet in the early 1980s. Groups that became very influential, such as Pollution Probe, the Canadian

Environmental Law Association, and the Canadian Institute for Environmental Law and Policy, all were formed in 1969 or 1970.[161]

In Canada Great Lakes Tomorrow linked up with the Conservation Council of Ontario, itself a coalition of mostly conservation groups. Although such groups did not make a lot of headlines, they did educate and capture the interests of many individuals on Great Lakes issues.[162]

The absence of large Canadian environmental groups in the early days of the GLWQA did not reflect absence of interest by members of the public. For example, many individuals participated in the public advisory panels for PLUARG and some, like Gil Simmons of Hamilton, remain pillars of citizen activism for the Great Lakes. Finally, some of the Great Lakes' best advocates were various Canadian scientists who played an enormous role in turning the results of scientific studies into public policy. Through the years Jack Vallentyne was noted for the globe he carried on his back at public meetings as a symbol of environmental activism and for his dedication of time and energy to environmental education in schools.[163] Others, like Alfred Beeton, Wayland Swain and other scientists on the U.S. side, assisted environmental advocacy groups in understanding scientific issues.[164]

As discussed below, both sides held public meetings in advance of the five-year review required by the Agreement, but no nongovernmental person participated in the actual review in 1976–1977. The final negotiations were carried out in secret as a traditional exercise of international diplomacy.[165]

Tracking of Progress Toward Agreement Objectives

Article 6 of the 1972 Agreement directed the IJC to make annual reports on progress towards the Agreement's objectives. Since reduction of phosphorus was the main aim at this time, Annex 2 required reports on annual reductions in phosphorus loadings. By 1975, the WQB recommended development of a Great Lakes International Surveillance Plan (GLISP) in order to coordinate water quality monitoring activities of USEPA and Environment Canada.[166]

Progress, or lack of it, in meeting objectives of the Great Lakes Agreement was tracked by the annual reports of the WQB and the reports of the IJC to the governments, which during this period were based mainly on distillation and evaluation of the reports submitted by the two advisory boards. The early WQB reports reflect two aspects of the implementation process that continue to this day.

On the one hand, recommendations reflect common concerns about protection of the Great Lakes rather than state, provincial, or national concerns. On the other hand, there is criticism in both directions about how programs are structured or how agencies operate. Nevertheless, the activities of the WQB board provide evidence that the parties to the Agreement have usually continued to work together even while they complain about each other.

The reports reflect Canadian complaints about the discrepancy between the proportion of its population for which "adequate" treatment was provided compared to the U.S. residents of the Great Lakes basin.[167] The U.S. complained about what it considered Canada's lack of regulatory authority to require effluent limits.[168] By July 1976, the 1975 WQB report hailed substantial compliance with the December 31, 1975, deadline for having municipal treatment programs either completed or in place as "one of the first major achievements toward restoration of water quality."[169]

Canada had drastically reduced the phosphate content of household detergents in 1972 by allowing use of nitrilotracetic acid (NTA) as a substitute. The USEPA had been forced to comply with a 1971 ban on NTA by a pronouncement from the Surgeon General's office that NTA was a threat to human health. This action undermined passage of a federal ban on phosphates in laundry detergents sponsored by Senator Gaylord Nelson of

Wisconsin, because only NTA was then available as a substitute. As mentioned earlier, the NTA ban did not become an issue in Canada as it had in the U.S.

In 1975, as the Canadian experience failed to confirm carcinogenic effects of NTA and WQB and IJC reports continued to urge all states to adopt phosphate detergent bans, Region 5 administrator Francis Mayo established a task force to present the arguments in favor of agency support for state bans in the Great Lakes basin.[170] USEPA headquarters opposition to the Region 5 proposal was overcome after EPA Administrator Train attended the 1976 IJC annual meeting, followed by a tour of several of the largest sewage treatment systems in Buffalo, Detroit, and Milwaukee as well as industrial sites in Cleveland and northern Indiana arranged by Region 5.[171]

Over objections of the Soap and Detergent Manufacturers Association and the Proctor and Gamble Company, from then on USEPA staff actively lobbied for state bans.[172] Eventually, such bans were adopted throughout the basin, in part because the bans reduced sewage treatment costs for phosphorus removal.[173] The third major source of phosphorus, runoff of agricultural fertilizers, was chiefly addressed in the conservation tillage demonstration projects described earlier.

The WQB also reported on the annexes concerning vessel wastes, dredging, and oil spills. The difficulty of proper disposal of dredge spoils remains a major issue in the U.S., but the joint contingency plan for oil spills has been periodically updated by the two Coast Guards.[174]

The WQB reported that public opinion surveys in both Canada and the U.S. found that the public considered water quality in Lake Erie to be improving. The same surveys found that the general public was willing to spend more money to protect Great Lakes water quality even though there was lack of awareness of existing government efforts.[175]

As the five-year review required by the 1972 Agreement was proceeding in 1977, the 1977 WQB report devoted as much attention to the growing evidence of pervasive toxic contamination as to the signs of slowing eutrophication.[176] Through the first years of the Agreement, the Research Advisory Board had increased its attention to toxic contamination.

Research Advisory Board Reports. From 1975, the annual full RAB report was supplemented by an ever-growing number of reports of workshops, conference proceedings, or special investigations, and by an annual directory of Great Lakes Research and Related Activities supplemented in 1976 by a separate report on research needs.[177] The 1975 report from the Standing Committee on the Scientific Basis for Water Quality Criteria, which described a proposal to link "structure and activity" of persistent bioaccumulative toxic contaminants, was the first step in a long process that eventually led to the USEPA's Great Lakes Water Quality Initiative in 1995.[178]

The board reports reflect how discoveries about the number and extent of toxic contaminants in the Great Lakes by both regulatory and research agencies coincided with other events that heightened public concern. The State of Michigan spent over $100 million dealing with the consequences of contamination of the milk and meat supply by polybrominated biphenyls (PBBs) about the same time that extremely high levels of PCBs were found in the sediments of Waukegan Harbor near a drinking water intake.222[179]

Discoveries of groundwater contamination by toxic chemicals in several locations in Great Lake states added to state agency concerns about the need to preserve water quality in the lakes for future water supply.[180]

IJC Reports to the Governments

The progress reports required in Article 6 of the 1972 Agreement continued the IJC's traditional principal function of tendering advice to the governments (Section 1 (c)), in this case on achievement of water quality objectives for the Great Lakes. The Agreement allows the IJC to make special reports to the governments at any time on new problems, but it has relied on the routine annual (later biennial) reports.[181] The IJC water quality reports are in

addition to separate annual reports to the governments on all of its activities and to reports on special references. The Agreement reports go to all eight Great Lake states and Ontario as well as the national governments, but formal responses to the Commission come only through the departments of State and External Affairs.

The first report, in 1972, largely concerned the establishment of the binational institutions required by the Agreement.[182] The second report, covering 1973 and part of 1974, for the first time raised the ongoing question about whether progress could "be confirmed on the basis of the scientific data and information supplied to the Commission."[183] The Third Annual Report for 1974, published in December 1975, raised another complaint, which became perennial, about the incomplete response of the governments to its earlier reports. The 1975 report cautioned that public perceptions of almost immediate results from Great Lakes cleanup could be overly optimistic because improvement in such a large system might not be measurable for decades. This report also urged the governments to address PCB problems, expressing doubt that the offer to limit sales made by the Monsanto Company, the sole North American manufacturer, would solve them.[184]

In 1976, the IJC noted that, while total phosphorus loadings had decreased, programs were behind schedule. Greater emphasis was put on the need for attention to toxic contaminants. Finally, the Commission concluded that "development of coordinated programs for research, surveillance, and remedial measures" was "a major accomplishment on which the Parties should continue to build."[185]

The general annual reports reflected the broad range of the Commission's other activities from 1972 to 1978. The Commission had received another reference on water quality for the Garrison Diversion project, which proposed to divert water from the Missouri River through a large irrigation project to the Hudson River drainage basin in North Dakota. There were also reports on references on water quality for the Rainy, St. Croix, St. John, and Poplar rivers.[186]

The IJC was also addressing issues relevant to the Great Lakes outside its Agreement-based activities. In 1975, the IJC had been given a reference on air quality in Michigan and Ontario in the Detroit--Windsor and Port Huron--Sarnia areas. The IJC's International Air Quality Board had also recommended attention by the governments to alleged transboundary flow of fluoride emissions between Massena, New York, and Cornwall Island, Ontario, long- range transport of pollutants from outside the Great Lakes basin, and miscellaneous other items.[187]

Finally, the Commission suggested that funding for its own operations should be reviewed in light of a General Accounting Office report that suggested its funding from the U.S. was inadequate.[188] There was no mention of the exclusion of the Commission from the five-year review that the parties had started in compliance with Article 9.

As the review began in 1977 in preparation for the negotiation of a new Agreement, the signs were increasing that eutrophication had slowed enough to meet at least some of Agreement goals, but new information about toxic contamination continued to emerge.[189] In 1978, a new Agreement was signed that retained a commitment to follow through on phosphorus and other original objectives but shifted the focus to elimination of toxic contaminants and a concept vaguely called "an ecosystem approach to management."[190]

3.2 Phase 2: Evolution of the Agreement between 1978 and 1987: The 1978 Agreement

This section outlines the evolution of the Great Lakes Agreement from just prior to negotiation of the new version that was adopted in 1978 until the mid-1980s. One question is why and how the changes in the 1978 Agreement came about.

The original Agreement had called only for restoration and enhancement "of water quality in the Great Lakes System" by improving water chemistry.[191] The new Agreement of 1978 introduced concepts of "an ecosystem approach to management" based on "virtual

elimination" of toxic contaminants.[192] While nearly everyone consulted for this project agrees that the Agreement has benefited the lakes, the ambitious goal of "virtual elimination" remains elusive and the Great Lakes community continues to seek full achievement of the new goals.

The first international accord with such broad goals, the new Agreement aimed "to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem" with "the discharge of any or all persistent toxic substances [to] be virtually eliminated."[193] Human health was identified as a concern by the broad definition that said substances are toxic if they can cause behavior abnormalities "after concentration in the food chain."[194] An IJC brochure that explained the Agreement to the general public said that the 1978 version "recognizes the complex relationships among WATER, LAND, AIR AND LIVING THINGS (plants, animals and man) [emphasis in original]."[195] A 1983 workshop on ecosystem management suggested that success with the new goals would depend on changes in lifestyle of residents of the basin.[196] The new Agreement was negotiated in a different context than the first had been.

Differences Between the 1972 and 1978 Agreements

The 1972 Agreement resulted from scientific consensus that reduction of phosphorus could slow eutrophication, and from political consensus that there was public support for action. The 1978 negotiations were triggered by the requirement in the 1972 Agreement for a "comprehensive review of the operation and effectiveness . . . during the fifth year after its coming into force."[197]

Several convergent factors have been suggested as reasons for the political commitment to change the Agreement. These factors included a sense of success in slowing eutrophication but growing recognition by agency officials, scientists, and policy-makers of the problems posed by toxic chemicals.[198] The expanding involvement of environmental organizations and the absence of a strong lobby against the changes helped create a favorable political climate.[199]

The period from 1972 to 1978 had been exciting for the Great Lakes community. Both governments made major funding available for research, for improving sewage treatment, and for public involvement in addressing the difficult problem of pollution from nonpoint sources. As signs of decreased eutrophication became visible, said one Environment Canada official, "everyone was basking in the glow of the 1972 Agreement."[200]

As the deadline for the five-year review approached, the attention of the research community and regulatory agencies was focused on major discoveries about the presence of persistent, bioaccumulative contaminants in the environment.[201] The presence of PCBs in fish throughout the Great Lakes was considered a potential threat to human health. Although manufacture and most uses of PCBs had been discontinued, it was realized that such stable chemicals would likely remain in the huge, virtually closed Great Lakes system for decades if not centuries.[202]

Identification of atmospheric deposition as a source for phosphorous had been followed by the 1975 demonstration of long range atmospheric transport of toxics when the highest levels of PCBs yet recorded were found in lake trout on remote Ile Royale in Lake Superior.[203] The discoveries that contaminants could be released from sediments by both biological and physical processes, and that PCBs can recycle back into the atmosphere by evaporation from the surface, added new dimensions to the problem of contaminant control.[204]

PCBs were not the only problem. The pesticide Mirex was found in Lake Ontario and downstream in the St. Lawrence River.[205] By the mid-1970s, research fostered by the Agreement had found hundreds of toxic contaminants in Great Lakes fish and waters and more were being found all the time.[206]

Research was being carried out by government, academic, and independent researchers but the PLUARG study was especially important for the 1978 Agreement.[207] A followup to the 1964 Lower Great Lakes Reference on the lower Great Lakes and St. Lawrence River that led to the original Great Lakes Agreement, the massive study produced over 100 published reports and involved hundreds of citizens and local officials in its 17 advisory panels—nine in the U.S. and eight in Canada.[208] There were several reasons for its importance:

1. It expanded the scientific understanding of nonpoint and land-based sources of pollution to the Great Lakes;
2. It laid the foundation for the development of the ecosystem concept and its incorporation into the GLWQA;[209] and
3. It expanded public participation in IJC activities.[210]

Jack Manno explains the importance of PLUARG in this way:

> The consultation process was unique, characterized by its geographic extent, binational involvement, and use of citizen panels. Citizens advised PLUARG on all aspects of the study. Their involvement not only had a direct impact on the final report but also positively influenced people's attitudes toward the GLWQA. It was successful in gaining both support and credibility, as was hoped.[211]

Similarly, the Upper Lakes reference study reinforced the fact that the atmosphere is also a diffuse source of contaminants to the lakes. For example, it was found that 25 percent of sulfates reached Lake Superior from the air; a figure of 1 or 2 percent had been anticipated.[212]

The presence of toxic chemicals had been recognized in the 1960s.[213] Now evidence of the extent of the problem was coming from many sources, including a Canadian program that measured the concentration of contaminants in the eggs of herring gulls.[214] What had been thought to be a "water quality" problem was understood now by officials, scientists, and the environmentalists active in the Great Lakes community to be an air problem, a land runoff problem, a contaminated site problem, and potentially a human health problem. The cleanup that had been thought possible by controlling phosphorus loadings now turned out to require elimination of possibly hundreds of chemicals that reach the lakes from many different sources.

Changes in Public Perceptions. Still another difference between the context for development of the 1972 and 1978 Agreements was a decrease in general public awareness because the problems caused by toxic contamination were not as visible as the algae, sewage, and fish kills had been before. The lakes looked better because of the success of the phosphorus controls and better sewage treatment, and the Cuyahoga River no longer caught fire, but few citizens understood the National Pollution Discharge Elimination System (NPDES) permits required by U.S. law or the terms of the COA.

Public concern about toxic contamination was aroused, however, by the events that were unfolding at Love Canal, where a residential community had been built on top of old hazardous landfills.[215] The legacy of Love Canal--the land permanently contaminated with toxic runoff leaching into the Niagara River, the reports of damage to children's health, and the evacuation of a community was evacuated, was said to have had a profound impact on the negotiations. In the U.S., public fears were reinforced by the evacuation of a whole town, Times Beach, Missouri, because of PCB contamination and by continuing reports of toxic contamination in the Great Lakes region.

Legal and Institutional Context. The international situation was also affected by changes in domestic laws and in environmental agencies. Some USEPA officials thought that Canada should adopt effluent limits to achieve at least a minimum national standard like the requirements of the Clean Water Act.[216]

On both sides of the border, the government environmental agencies that had been new when the first Agreement were signed now had greatly enlarged agendas that distracted from the Great Lakes commitments. Environment Canada and the Ontario Ministry of the Environment (now the Ministry of the Environment and Energy) had been established in 1970 and 1971, respectively, and the Canada Centre for Inland Waters in the same period as the original Agreement was being developed. Now the struggle of officials of these agencies to keep a Great Lakes focus was complicated by increasing demands on their budgets for other purposes.[217]

Through the 1970s, Congress continued to broaden the total scope of USEPA's operations with new laws and expansion of requirements under old ones. In 1976, a Great Lakes National Program Office had been established in Region 5, with a charge to expand Great Lakes involvement of the regional offices in New York and Philadelphia. USEPA headquarters continued to try to reduce Great Lakes funding.

Program managers questioned the value of so much staff time spent participating in the advisory board structures, which they saw as IJC business irrelevant to national purposes.[218] State agencies were also becoming more reluctant to participate in IJC affairs as their federal grants became smaller and had to cover more activities.[219]

Negotiation of the 1978 Agreement

The IJC had no official role in the negotiations and seems to have had no substantial influence or input into them, apparently because the national governments viewed the Agreement as between the parties alone.[220] At the 1978 annual meeting, Canadian Commissioner Keith Henry's public criticism of the lack of IJC input is said to have cost him his position.[221] (The IJC did not participate in the later 1987 negotiations either.)

The formal process began on April 13, 1977, one day before the fifth anniversary of the signing of the 1972 Agreement and the date stipulated for completion of the review. Separate preparation of advance recommendations on both sides was followed by consultation and preliminary negotiation between the staffs of agencies involved with the Agreement. Early in 1978, the final review and negotiations were quickly carried out outside of the public limelight by teams of six negotiators on each side.[222] The basic Agreement was in place by May, but the signing was delayed while internal disagreements about funding were resolved on the U.S. side.[223]

Three major issues emerged in the review and advance negotiations: U.S. effluent standards versus Canadian water quality objectives, the Great Lakes Regional Office, and an ecosystem approach to management with the virtual elimination of toxic contaminants. The first two issues were raised mainly by the Washington headquarters of USEPA, and were controversial. The ecosystem approach was accepted without controversy on both sides.

The Review Process and Negotiation. The final negotiating teams were nominally led by the State Department and the Department of External Affairs, although USEPA and Environment Canada were actually in charge.[224] The lead negotiators were Robert Slater, Director of the Ontario Regional Office of Environment Canada, and George Alexander, who had been asked to stay on as Region 5 administrator following the election of President Carter in 1976 in order to participate in the negotiation.[225]

To prepare for the review, both sides established their own senior review groups or committees to begin formulating negotiating positions. The U.S. Senior Review Group was headed by Barbara Blum, Deputy Administrator of the USEPA, with staff from other federal agencies as members. Thomas Jorling, USEPA Assistant Administrator for Water, appears to have been the actual leader for this group and raised the major issues that had to be resolved as the review of the Agreement proceeded.[226]

Jorling's main interests were to eliminate the Great Lakes Regional Office and to persuade Canada to adopt a regulatory approach compatible with the U.S. approach as

embodied in the Clean Water Act. Otherwise, the Senior Review Group depended heavily on its Sub-Group A for detailed recommendations for changes in the Agreement article by article and annex by annex and left leadership in the final negotiations to its chair, George Alexander.[227]

The U.S. Sub-Group A included representatives of the federal and state agencies who participated in implementing the Agreement. Seven work groups, also headed by USEPA staff directly involved in Agreement activities, were formed to address specific topics including water quality objectives and surveillance, phosphorus, hazardous substances, research, nuclear wastes, and point and nonpoint sources of pollution.[228] The work groups, comprised of bureaucrats who were counterparts from each country, negotiated the sections that would eventually become individual annexes in the new Agreement. The negotiations went smoothly at this level, with the working groups given fairly free rein in negotiating issues on which they worked directly.[229]

Many of the provisions were agreed to in advance since the negotiators sought to reach agreement on the major components of the proposals to each other prior to the formal negotiations on behalf of the national governments. Still, some controversial issues had to be resolved and some of the most important innovations were adopted by the final negotiating team behind closed doors.[230] Formal conclusion of the Agreement was delayed for several months while USEPA resolved an internal debate over funding for Great Lakes programs.

Public Participation. Both the U.S. and Canada made limited efforts to obtain public participation in the review during the summer of 1977. The lack of public involvement in the 1978 Agreement was remembered later when another review was proposed in the 1980s.[231] On the U.S. side, no record of significant results of four public meetings, or even their exact locations, has been found. USEPA did send the work group reports to several public interest groups for comment. Alexander informed Barbara Blum that "no comments of substance were received from the public interest groups because of the short time frame in which comments were requested."[232]

In July, 1977, Canadian officials released documents with general descriptions for public hearings in Toronto and Thunder Bay. These meetings were coordinated with an Environment Canada sponsored "Great Lakes Week," a series of activities aimed at making people aware of issues and threats to the Great Lakes. Release of the official background documents that would form the negotiating position of the governments was not the Canadian "style," one official stated.[233] Neither meeting was controversial or made headline news.[234]

Effluent Standards versus Water Quality Objectives. The first controversial issue was Jorling's proposal that Canada adopt an industrial pollution control program like that of the U.S. Clean Water Act, with effluent limits for direct discharges. The U.S. said that the Canadian approach of setting water quality objectives that attempted "to tailor the discharge to the assimilative capacity of the receiving water" was like allowing the equivalent of only primary treatment for both sewage and industrial discharges rather than the minimum "best practicable treatment" required by the U.S. law.[235]

The U.S. also wanted both sides to adopt basin-wide water quality standards. The effect of this proposal would have been to broaden the scope of the Agreement to include all tributaries, rather than just those water bodies through which the international border runs.[236] Finally, the U.S. proposed language for Programs and Other Measures in Article 5 that would also cause Canada to open up its pollution control system to public scrutiny as required in U.S. water law.

Canada rejected all three proposals. Although the U.S. law had been strengthened in 1977, neither Canadian federal nor Ontario water quality laws were scheduled to be revamped. Canada also considered the tributaries to be within domestic, not international,

jurisdiction. Munton summarized Canada's arguments against the effluent limit approach as follows:

> The overall water quality objectives approach is, of course, much more compatible with the Canadian position of the two countries' "equal rights" to the use of the Great Lakes than was the effluent standard approach. The latter would require similar source-by-source reductions despite the disparity in the total amounts of pollutants from each side. The Canadians argued each country should be responsible for taking such measures as necessary to ensure both together met the common objectives [of the Agreement] in the boundary waters.[237]

Great Lakes Regional Office. The U.S. also proposed elimination of the IJC Great Lakes Regional Office in Windsor. While acknowledging that IJC oversight of the Agreement process was needed, the USEPA thought the office was overreaching its role by initiating activities that required commitment of staff and resources that could be better used by the government agencies of the parties. Without the regional office, the IJC could depend on the WQB and the SAB.[238] This issue would also be raised a decade later on the Canadian side. In 1977 this position was strenuously opposed by Canadian negotiators. In the end it was agreed to define the responsibilities of the office, which had not been done in 1972. First, the office would provide technical assistance and administrative support and report to the advisory boards. Second, the IJC would oversee public information services by the regional office for both the Commission and the boards.

This arrangement was not well received by the IJC members, particularly Commissioners Maxwell Cohen and Keith Henry. Canadian co-chair Cohen is reported to have felt that the IJC's capacity to provide independent review of the progress of governments under the Agreement required independence for the regional office.[239] In June of 1978, the two governments undertook a special review of the staffing and functions of the office, and the IJC made an additional review in 1979 after conclusion of the new Agreement.

An Ecosystem Approach to Management. The concepts of an ecosystem approach to management and the goal of virtual elimination of toxic contaminants were included in the Agreement during the final closed negotiations. The Canadian side is credited with providing the "ecosystem" language and a number of officials can take credit for supporting it during the actual negotiations.[240] It is not clear whether the language was proposed as an alternative to the U.S. preference for specifying the exact levels of reductions required in discharge of effluents or the exact level of cleanup of hazardous materials at a site.

It is also not clear whether the implications of the concept were fully understood. George Alexander said in 1995 that "some who had a fair idea downplayed the possibilities to prevent a backlash against its inclusion." He also said that he himself had brought appreciation of the need for a cross-media or more integrated, approach to environmental management from his earlier experience in the USEPA regional office in Texas.[241]

Funding Issues Raised by USEPA. In the negotiations, USEPA proposed to reduce federal costs for collecting monitoring data in the open lakes by submitting the tributary data that the states were required to submit to receive funding for administering NPDES permits. This proposal was related to a headquarters USEPA attempt to cut Great Lakes funding by half as the Agreement review proceeded.

In January 1978, Edith Tebo, GLNPO director, reported that Michigan, Wisconsin, Indiana, Ohio, and Minnesota had all refused federal grants for monitoring. They feared the states would have to assume all monitoring responsibility if federal funding declined in the future even though they considered the obligations of the Great Lakes Agreement to be a federal responsibility.[242]

The proposed reduction from $11.1 to $5.5 million was also protested by the USEPA Office of International Activities and by the State Department.[243] The cuts were restored before the Agreement was signed, after Senator Nelson of Wisconsin persuaded all sixteen Great Lakes senators to write to President Carter.[244]

Conclusion of the New Agreement. Apart from the issues identified above, negotiations proceeded as planned, with the exchange of drafts of various texts from late 1977 to March of 1978.[245] The major issues, except for the regional office, were finally resolved at a March 30 negotiating meeting in Ottawa. At a plenary meeting on May 11, 1978, the basic Agreement was in place with only minor differences in text to be finalized.

The Trudeau Cabinet apparently approved the Agreement in mid-July 1978. U.S. approval was delayed by the regional office issue and by efforts to reduce funding for Great Lakes programs.[246] The Agreement was signed for the two governments in Ottawa on November 22, 1978, with no formal ceremony and little notice in the news media.[247]

The major objection to how the negotiations were carried out came from representatives of the states on the U.S. side. The final negotiating team, which operated with great secrecy, had only one state representative as a member, William Marks of the Michigan Department of Natural Resources. In response to state complaints, Marks said he had not consulted with the other states because of the State Department insistence on secrecy. The State Department said it had assumed that Marks had consulted the other states. Although many state officials credit the Agreement with beneficial results, this example demonstrates the ongoing ambivalence of the states about their role.[248]

Major Changes in the 1978 Agreement

The most profound new feature of the 1978 Agreement was the call for an ecosystem approach to management, making ecological integrity rather than only water chemistry the accepted goal of the Great Lakes community (see Table 2 for a complete list of changes).[249] The concept is implicit in references to the "Great Lakes Basin Ecosystem" as well as the "Great Lakes system" throughout the new version.

The distinction is defined in Article 1, which states that "Great Lakes Basin ecosystem" means "the interacting components of air, land, water and living organisms, including man . . ." The "Great Lakes system" means all of "the streams, rivers, lakes, and other bodies of water that are within the drainage basin," in other words, the physical hydrologic system. Both definitions apply above the point where the St. Lawrence River becomes the international boundary between the two countries.[250]

Several converging factors appear to have contributed to the inclusion of the concept in the new Agreement. They include the work of the RAB, results of the PLUARG study, the rising concern about toxic contamination, and the identification of atmospheric deposition and hazardous waste disposal sites, such as Love Canal, as sources of toxic chemicals to the lakes, in addition to new understanding about contaminated sediments and how toxic substances cycle within the ecosystem.

The RAB Contribution. Jack Vallentyne, the first Canadian co-chair of the RAB, was one of the scientists who advocated recognition of the links between water quality and sources of pollution from land and the air. At a meeting in Detroit in the fall of 1976, Vallentyne established a committee to explore the ecosystem approach, which was then recommended to the IJC in the annual report of the RAB in July 1977.[251]

In the same month, the IJC gave a positive response to the concept and an ad hoc Ecosystem Study Committee was established in September of 1977.[252] Support for the concept also emerged from outside of the IJC family. The Great Lakes Fishery Commission endorsed the board's ecosystem recommendation in a joint meeting with the IJC in October of 1977.[253]

TABLE 2

Key Differences Between 1972 and 1978 Agreement

	Section	Description of New Section
Definitions	I (g)	- definition of "Great Lakes Basin Ecosystem
	I (v)	- definition of "toxic substances"
Purposes	II	- new "purpose" section and three policy commitments
Specific Objectives	IV.1(d)(e)(f) IV.2 and 3	- new Specific Objectives
Standards, Etc.	V	- various amendments
Programs	VI	- new deadlines and various programs commitment pertaining to municipal sources, industrial sources, inventory of abatement requirements, land based sources, persistent toxic substances, airborne substances and surveillance and monitoring
Powers of IJC	VII.1(a)(d)	- additional responsibilities given IJC pertain to data collection, tendering of advice
	VII.3	- IJC to report biennially
	VII.6	- recognition of SAB and WQB
Joint Institutions	VIII	- clarification of roles of Water Quality and Science Boards and the Regional Office
Consultation	X	-review of Agreement folwing the third biennial report of the Commission
Annexes		Inclusion of New Annexes

The conceptual support for the approach was furthered in the Fifth Annual Report of the IJC in 1977. The report stated that "the 'ecosystem approach' recommended by the Research Advisory Board may have significant benefits for the long-term management of the Great Lakes, by placing it in a wider context and providing a framework for assessing the real impact and significance for changes within the Great Lakes System."[254] In March 1978, the Commission requested that the RAB undertake a more detailed analysis of the concept on "(i) any difficulties involved in melding the ecosystem approach and the water quality objective approaches, (ii) practical means of implementing the combined concept, and (iii) research needs and whether such needs relate to data, management techniques, or other aspects."[255]

In June, 1978, the earlier ecosystem report, which had gone into a second printing with the board name changed to Science Advisory Board, was submitted within the annual report to the IJC.[256] One commentator says that, with the PLUARG reports, this report paved the way for the incorporation of the ecosystem concept into the 1978 Great Lakes Water Quality Agreement and the formal adoption of the concept by the governments of Canada and the United States.[257] All but one of six changes in specific wording suggested by the RAB report found their way into the 1978 Agreement.[258] A name change to "Agreement between the United States and Canada on Boundary Waters of the Great Lakes Basin Ecosystem" was not accepted.

Virtual Elimination. "Virtual elimination" of toxic contamination is the second new significant concept in the 1978 Agreement. Its origin is less clear. A new section on purposes of the Agreement stated that "the discharge of toxic substances in toxic amounts [shall] be prohibited and the discharge of any or all persistent toxic substances [shall] be virtually eliminated."[259]

The negative picture that scientific studies had begun to paint of the impact of toxic substances, and in particular, persistent contaminants, had alarmed state agencies. Michigan's concern was heightened by discovery of 900 sites where groundwater had been contaminated by dry cleaning chemicals and fear that groundwater could not continue to be used for drinking water.[260] Another factor was that the U.S. Clean Water Act already had a goal of eliminating the discharge of all pollutants into navigable waterways.

The negotiators point out that the goals "virtual elimination" and "zero discharge" made sense at the time, despite the recognition that they may be operationally difficult. The term "zero discharge" was thought to emanate from the Clean Water Act.[261] The policy statement is fortified by Annex 12, which directs that regulatory programs designed to control toxic substances are to be undertaken in "the philosophy of zero discharge." Views of officials about its importance at the time had ranged from "innocuous" to "fundamentally important."[262] It may be that the significance of the term was downplayed in order to further its use.

The Agreement borrowed another concept from the U.S. Clean Water Act in the call for elimination of discharge of toxic substances "in toxic amounts." A toxic substance is broadly defined in the 1978 Agreement as "a substance which can cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological or reproductive malfunctions, or physical deformities in any organism or its offspring, or which can become poisonous after concentration in the food chain or in combination with other substances."[263]

Other Changes. The new Agreement also called for revised water quality objectives, including new, more stringent target loadings for phosphorus for each of the lakes, with the exact reductions on both sides to be negotiated.[264] New deadlines were set for the adoption of municipal and industrial pollution abatement programs by the end of 1982 and 1983 respectively. A program to identify sources of pollutants to the atmosphere was also included. The 1978 Agreement retained the same essential format and framework as the 1972 Agreement, but is much different from its 1972 predecessor. The differences include

the fact that the terms were subject to "re-negotiation," the change of the focus from phosphorus to toxics, the change in approach from a "man-in-the-system" view to an ecosystem approach, and the set of new goals, together with general and specific objectives.[265]

In summary, circumstances that led to incorporation of the ecosystem approach to management concept in the 1978 Agreement included information that had emerged from research carried out under the 1972 Agreement, concurrent events including Love Canal, and the initiative of farsighted individuals. It is probably fair to state that the implications of the concept were not fully understood during the final negotiations that were conducted essentially only by the two six-member national teams. In the end, the 1978 negotiations are remembered by the lack of lasting controversy. Although the results of the negotiation remain apparent and vital, one negotiator said the process went "relatively smoothly."[266]

The Joint Institutions

Essentially the joint institutional arrangements under the original Agreement continued under the new 1978 version. Table 3 illustrates the organizational arrangement of the boards and the IJC.

The Role of the International Joint Commission. After adoption of the 1978 Agreement, the IJC essentially continued the same kind of activities it had pursued under the 1972 Agreement, with some redirection and expansion. In its Seventh Annual Report, the IJC discussed its interpretation of its role under the new Agreement:

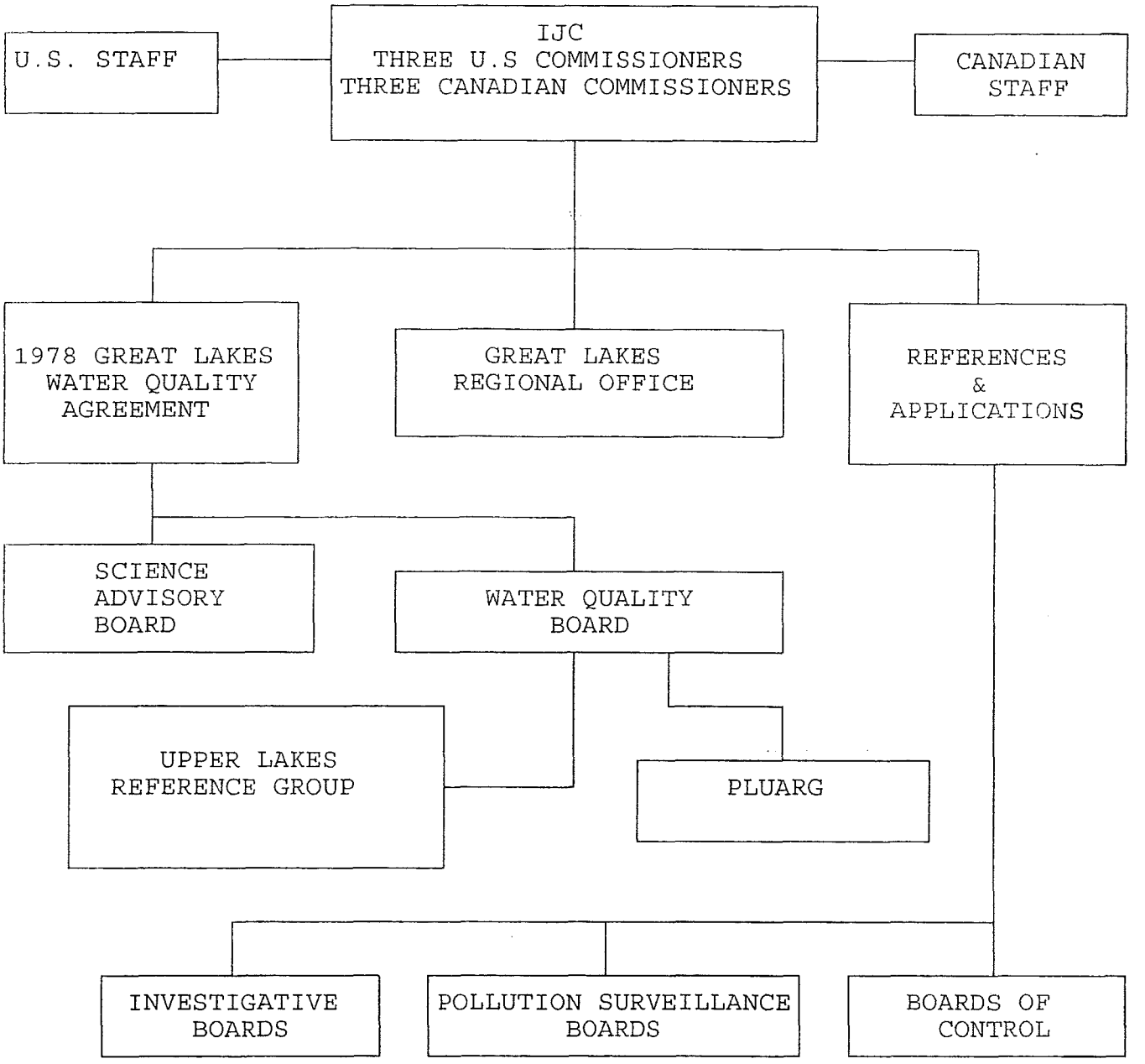
> The role of the Commission is recognized as primarily one of monitoring, assessing, and subsequently advising the Parties to the Agreement concerning the state of the Great Lakes Basin ecosystem and the adequacy and effectiveness of any measures taken by the various Great Lakes jurisdictions to meet the terms of the Agreement. . . . Any matter that might affect the quality of the Great Lakes Basin ecosystem, and thereby the quality of the boundary waters of the Great Lakes System, are included in the mandate of the Commission.[267]

Advisory Boards and Regional Office. As their internal processes evolved from 1978 to the mid-1980s, the operation of the IJC institutions was increasingly criticized by the government agencies and nongovernmental sources. These critiques provided the rationale for changes made toward the end of the decade, as the institutions continued to struggle with the new challenge of the 1978 Agreement to move from improving water chemistry to ecosystem protection.

Water Quality Board. The WQB remained "the principal advisor to the Commission."[268] In 1980, a new directive outlined its duties as including tracking and assessing the effectiveness of programs of the parties relevant to the Agreement and its annexes, and elaborated on the terms of reference in the 1978 Agreement.[269] Its own activities and the program evaluations were to be reported every two years, together with recommendations for improvement.

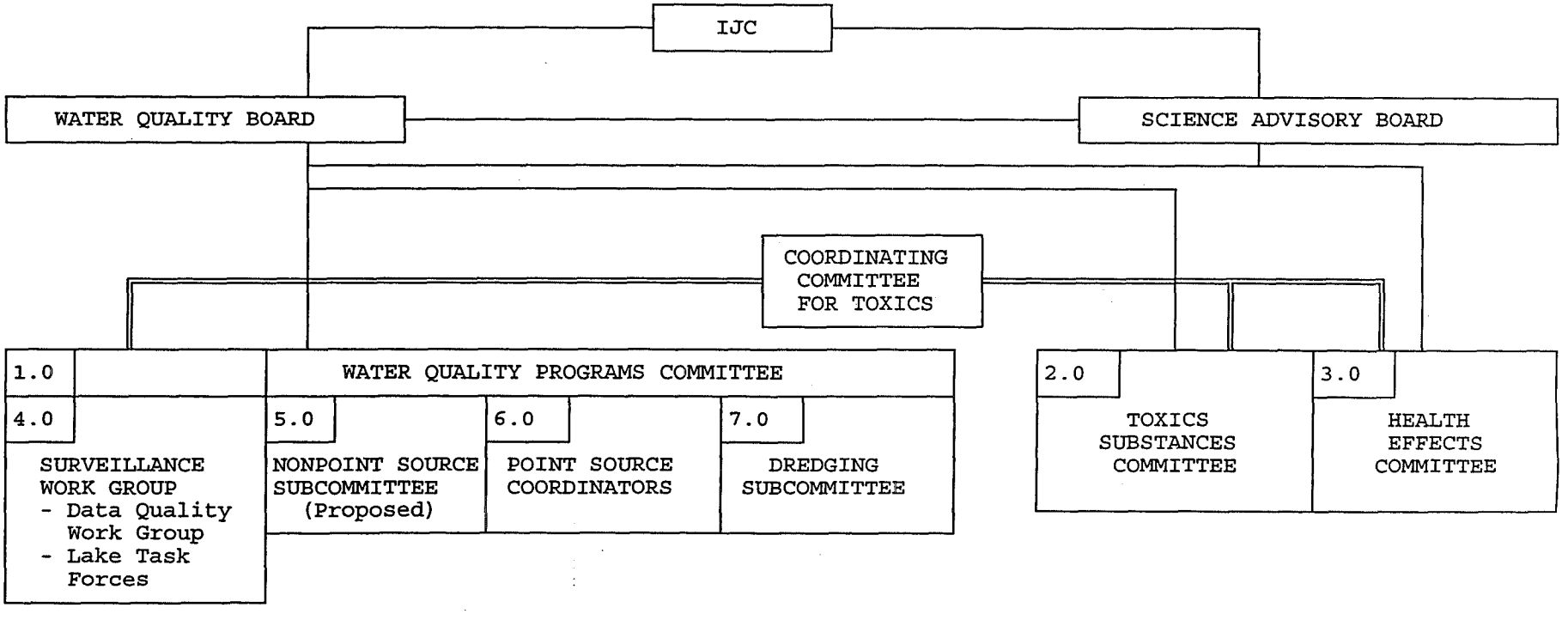
The committee structure was expanded with a Program Committee, Toxic Substances Committee, and ad hoc task forces (see Table 4).[270] The Program Committee was to prepare the biennial reports to the IJC and also oversee the various subcommittees on surveillance, point sources, nonpoint sources, and dredging. This committee was also to assist in designating Areas of Concern. Personnel of the agencies represented on the board attended numerous meetings to provide and evaluate information and spent much time writing reports for the IJC.[271]

TABLE 3
IJC ORGANIZATIONAL CHART
(1978-1979)



Source: Adapted from International Joint Commission, 70 Years of Accomplishment Report for Years 1978-1979 (Ottawa-Washington, n.d.), p. 53

TABLE 4
ORGANIZATIONAL CHART OF THE WATER QUALITY BOARD
(1980-89)



Source: Adapted from National Research Council and the Royal Society of Canada, The Great Lakes Water Quality Agreement - An Evolving Instrument for Ecosystem Management (Washington: National Academy Press, 1985), p. 82

The persistent dilemma for members of the WQB was that they were expected to make judgments as independent professional experts in the tradition of the IJC about the agencies that employed them. The issue of possible conflict of interest for the WQB members was raised by the staff of the IJC national secretariats, by the Commission, by commentators on the IJC as an institution, and by environmentalists. Some believe the criticism failed to recognize the real contribution of the WQB.

Ian Jackson summarizes the situation as follows:

> Responsibility for implementing the Agreement rests primarily with the two federal governments, and the Commission was therefore appointed as official critic of the Governments that appoint its members. Perhaps the Governments believed that the criticism would be moderated through the device of making the "principal advisor" to the Commission a Great Lakes Water Quality Board that was composed entirely of state, provincial, and federal government representatives. If so, their ingenuity produced an unexpected result. What was created by this provision was an arrangement that was illogical in principle but remarkably productive in terms of making an ecosystem-based Water Quality Agreement actually work.[272]

Former WQB members attribute this result to three factors: First, as high level managers of the jurisdictions' environmental programs, members of the WQB "could make things happen."[273] They could even make recommendations through the IJC that they would have to deal with in allocation of budgets and program decisions of their agencies. Second, members could also use the WQB as a lever for action, discussing policy with their peers and returning to their home jurisdictions with stronger arguments for action.[274] Third, assisting the common fact-finding role of the IJC could help provide a foundation for solutions to problems and help implement the Agreement on both sides.[275]

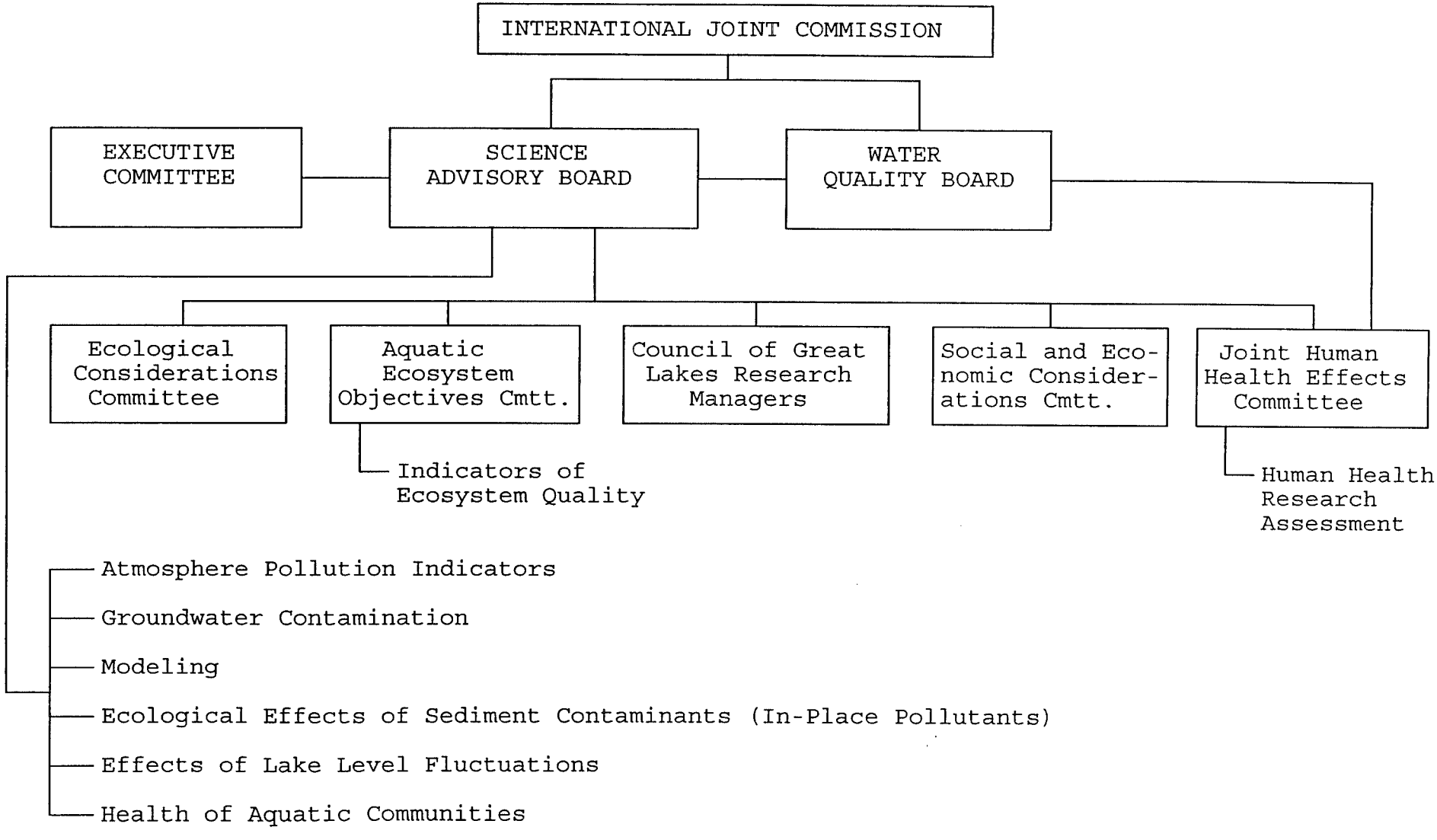
Still, criticism of the WQB became increasingly vocal through the 1980s. The report of the National Research Council and Royal Society of Canada [hereinafter referred to as the NRC/RSC report] was expressly critical in this regard.[276] The first three biennial reports of the IJC to the governments also commented on this issue.[277]

The strongest criticism was generated by Great Lakes United (an organization discussed below) in a 1987 report *Unfulfilled Promises: A Citizens' Review of the International Great Lakes Water Agreement*.[278] The report proposed that nongovernmental members be appointed to the board and that a separate Citizens Advisory Board also be created. Both the IJC and the NRC/RSC report questioned the Commission's ability to discharge its coordination duties through the activities of the WQB and SAB, in part because of lack of resources that "affected the ability to keep essential levels of personnel in certain activities and have inhibited coordinated research programs."[279] Foreshadowing changes that were to transform Agreement processes in the early 1990s, the NRC/RSC report recommended that "the coordinating responsibilities for the control programs that implement the Agreement be left to the parties, rather than the Water Quality Board. Coordination should be handled through bilateral government-to-government meetings."[280]

Science Advisory Board. The basic mandate of the SAB did not change with its new name under the 1978 Agreement: to "provide advice on research to the Commission and to the Water Quality Board."[281] This board had three committees in 1987: the Ecological Committee, the Societal Committee, and the Technological Committee. It also participated in three joint SAB/WQB committees: the Ecosystem Objectives Committee, Human Health Effects Committee, and the Coordinating Committee on Toxic Chemicals. In addition to the committee structure, the Council of Great Lakes Research Managers reported to the IJC through the SAB. Table 5 shows the organization of the Science Advisory Board.

Two themes persisted during this time and beyond. First, there was the question of how "science" oriented the SAB should be in its work. The agenda was broader than review and assessment of physical and biological science, with considerable attention to the

TABLE 5
ORGANIZATIONAL CHART OF THE SCIENCE ADVISORY BOARD (1980-89)



Note: The Council of Great Lakes Research Managers reports to the Chairman of the Science Advisory Board and to the Commission

Source: Adapted from National Research Council and the Royal Society of Canada, The Great Lakes Water Quality Agreement - An Ecological Instrument for Ecosystem Management (Washington: National Academy Press, 1985), p. 81

"societal" and "technological" side of science that, in fact, led to many policy development accomplishments of the board, especially in the latter part of the 1980s.

The growing emphasis of the SAB on its broadened view of science left an emerging gap concerning the more specific research needs and assessments in the Great Lakes. This gap, and the continuing need to directly engage research scientists, led to the establishment of the Council of Great Lakes Research Managers (CGLRM) as a new advisory body that would provide an inventory and assess research programs in the Great Lakes.[282]

Board membership was another recurring issue. From the beginning, the board had included not only biologists and water chemists but also social scientists, as well as citizens and representatives of industry. The NRC/RSC report supported this appointment philosophy, which was consistent with the wide view of its mandate.[283] This issue persisted into the next decade.

Council of Great Lakes Research Managers. The CGLRM, established in 1984, consists of managers of research programs pertaining to the Great Lakes. It collects and disseminates information on research programs, identifies research needs, and assists in the coordination of research efforts in the Great Lakes basin. The council initially reported to the IJC through the SAB.

Views on the council were divided between those who believed that inventorying would help deal with declining funding for research due to the fiscal policies of the conservative federal governments and those who believed that better coordination was needed among research agencies. An attempt in the late 1970s by the Great Lakes Basin Commission to promote coordination had been perceived by scientists and the research agencies as an attempt to set research agendas.[284] Some scientists still suggest that the tasks of the CGLRM belong to the SAB.[285]

Great Lakes Regional Office. Within the IJC structure there was an undercurrent of tension about who was in charge. A slight shift in the responsibility of the regional office was one of the subtle but important changes in the 1978 Agreement. Under the 1972 Agreement, the regional office reported to the IJC itself. Article 8 now stated that the regional office would report to the boards in providing technical and administrative assistance but to the IJC in providing public information services. For a period in the early 1980s, the role of the regional office was put in question by the fact that the person in charge of public information worked out of the Washington secretariat office.[286]

One objection to the change was that the governments would now have the power to select the director and staff, since it was the governments who actually named the board chairmen. The reviews of the regional office by the parties and by the IJC that had been agreed to in negotiation of the Agreement were reported on in 1979.[287] The report of the parties clarified the roles of the director and board secretaries and recommended that a request by the Commission for the verification of data cited in the board reports should only be pursued after it had been discussed with the appropriate board chairs. Several positions, including a deputy director, were eliminated and the director's term extended to up to four years.[288] The internal review by the IJC resulted in no major changes but questions about the operation of the regional office continued. The 1985 NRC/RSC report reiterated the debate about the divided reporting structure and recommended that the regional office report directly and solely to the IJC.[289]

Actions of the Parties

The 1980s began with the largest gap in membership on the IJC in the life of the Agreement as the new conservative governments that had taken power in both countries delayed making their appointments. This appointment process began a new pattern of replacement

with every change of administration on the U.S. side and a similar, although less consistent, trend in Canada.

President Reagan took office in January, 1981. On March 4, he abruptly dismissed all three of the Carter administration appointees. One of them, Charles Ross, had served under five presidents, both Democratic and Republican. A new U.S. panel of members did not take office until more than six months later. Prime Minister Brian Mulroney appointed Richard Olson in January and Charles Bedard in August, while only J. R. Roy stayed in office through the uncertain transition period.

The new Commissioners were appointed by governments that were struggling with the effects of inflation and who sought to reduce government expenditures in general and spending on environmental programs in particular. The Reagan administration disbanded the Great Lakes Basin Commission. Federal funding was reduced for university and agency research and for regulatory programs.

As jurisdictions "tightened their belts," agency managers on both sides of the border questioned the commitment of personnel time and money for attending meetings and writing IJC reports for a multiplicity of subcommittees, task forces, and work groups, particularly for the WQB.[290] One WQB member and agency head thought the early 1980s were an "empire building stage" dring which when the IJC attempted to provide the sole framework for the jurisdictions to address water quality issues.[291] Questions about the efficient use of resources continued through the decade to become an issue for review of the Agreement near its end.

The Provinces and States. New Canada-Ontario Agreements were negotiated in 1982 and again in 1986.[292] Both essentially continued the same money transfer structure, with the federal government committing to provide about 15 percent of the costs, the province about 40 percent and the municipalities the balance of 45 percent.[293]

In this period, the Progressive Conservative Party that had been in power in Ontario for 40 years was replaced with a new New Democratic Party/Liberal minority coalition government. As the new government took over, public outcry occurred over the discovery of large mysterious "blob" of toxic contaminants in the St. Clair River near Sarnia that corroded a diver's helmet.[294]

Ontario established a new water quality regulatory program called the Municipal-Industrial Strategy for Abatement (MISA).[295] The purpose of the new program was to set technology-based effluent limits that would "virtually eliminate" discharge of toxic substances to the waterways of Ontario. Most observers link this goal to the Great Lakes Agreement.

Quebec had been included in many Great Lakes activities even though the jurisdiction of the Boundary Water Treaty and the Great Lakes Agreement stops at Cornwall-Massena in the St. Lawrence River just short of the Quebec border. During this period, a prominent Montreal environmentalist wore black arm bands at Great Lakes events to symbolize Quebec's absence. Quebec remains a silent partner in the Great Lakes regime, according to one Canadian activist, because it does not want to be committed to achieve the goals of the GLWQA within its jurisdiction.[296]

Most high-level state officials continued to participate in the WQB. Yet the states also criticized "a proliferation of committees and subgroups" for the WQB. There were also complaints about too much time spent discussing the board's budget and about the time spent on administrative matters rather than policies and programs.[297]

At times, state environmental agencies would work with environmental organizations to use the Great Lakes Agreement to prevent weakening of state laws or the water quality standards adopted for compliance with the Clean Water Act. In Indiana, environmentalists cited the Great Lakes Agreement in fighting repeal of the state detergent ban in nearly every biennial session of the legislature.[298] In Wisconsin, a paper company attempt to weaken PCB discharge limits was defeated.[299]

Most state officials credit the Agreement with creating a sense of Great Lakes community and a climate that promoted more regional action than would have otherwise occurred. The Great Lakes Charter, signed by the states in 1985, dealt with diversion, not the water quality issues of the Agreement. Still, the charter set the stage for a Great Lakes Toxic Substances Control Agreement in 1986 in which the governors committed to achievement of the Water Quality Agreement goals for contaminants.[300] The state agreement's call for "coordinated regional action" echoed the spirit of the binational accord but went further in committing the governors to lobby the federal government for uniform national standards to discourage competition for economic development when the Great Lakes region was struggling with the decline of its economic base in manufacturing.[301]

A Council of Great Lakes Governors organized in the early 1980s was given responsibility for coordination and oversight duties in the toxics agreement. On November 3, 1986, the Premiers of Ontario and Quebec and the governors signed a Memorandum of Understanding on the Control of Toxic Substances in the Great Lakes Environment, similar to the states' toxics agreement. The state toxics agreement has not lived up to its potential but is considered to have helped set the stage for later development of the Great Lakes Water Quality Initiative by a federal/state task force.[302]

The Great Lake States, as well as Ontario, also helped begin Remedial Action Plans in the 1980s. The geographic locations that the WQB identified where objectives of the Agreement were not being achieved were now called "Areas of Concern." In 1983, a "Master Plan" for cleanup and restoration of the watershed of the Grand Calumet River and Indiana Harbor and Ship Canal in Lake County, Indiana, had been produced by the Indiana Board of Health, Region 5 of USEPA, and the Lake Michigan Federation's Grand Calumet Task Force project.[303] The WQB proposal that such plans be developed for all the Areas of Concern was conceived as an element in the ecosystem approach called for in the 1978 Agreement.[304]

When the question of another review of the Agreement was raised in the mid-1980s, the states decided that the Agreement should not be altered in any major way but required "minor technical adjustments."[305] Public involvement in Agreement processes expanded greatly in the years preceding negotiation of the next version of the Agreement in 1987.

The Public and the GLWQA

In 1979, the IJC established a Standing Committee on Public Information to assist in providing the public information service called for in the 1978 Agreement.[306] By November 1980, the two member committee (American Jean Hennessey and Canadian Bernard Beaupre) had worked with the public information officer of the Windsor office to develop a formal public information policy.[307]

The basic concept of the policy was that citizens have rights to participate in IJC activities and ought to be encouraged to do so. The policy also stressed provision of information to citizens while studies and activities were being carried out, not just after a decision had already been made, and that the Commission's credibility would be improved by demonstrating that public opinion had been considered in making decisions. Specific mention was made of the need for increased funding to support public participation.[308]

Adoption of this policy was followed by expansion of the IJC's public information activities through the next decade. The 1980s began with distribution of a slide show about the 1978 Agreement titled *Promises to Keep*. Copies were provided to several environmental organizations who agreed to act as distributors to audiences throughout the basin. The "unfulfilled promises" that the binational coalition Great Lakes United later complained about referred to this slide show.

As the 1980s progressed, the call for an ecosystem approach to management in the 1978 Agreement seemed to be reflected in the growing concern of environmental organizations for the system as a whole.[309] Citizen advocacy for the Great Lakes increased

for both Agreement-related and other issues throughout the Great Lakes basin and in Ottawa and Washington.

The form of the advocacy was consistent with the tradition in each country. In the U.S., this activism reflected the emphasis on public involvement and in U.S. environmental laws.[310] Canada has a different tradition of advance consultation before announcement of new policies.[311]

Citizen groups also obtained support for their activities from different sources in the two countries. In the U.S., most support comes from philanthropic foundations and organization members. In Canada, the government often directly funds citizen participation in policy debates. Nevertheless, by the 1980s environmental activists from both sides were increasingly working together and with the IJC and government agencies. Overlapping participation on different issues by many of the same individuals created a network of environmental activists who increasingly developed common strategies for dealing with Great Lakes issues.[312]

Some of the U.S. leaders had met through the Policy Involvement Work Group of the Great Lakes Basin Commission in the late 1970s. The Sierra Club made more efforts to include Canadian members in its volunteer Binational Great Lakes Committee, and the staff of its Midwest Office in Madison, Wisconsin, gave greater priority to Great Lakes issues. The Lake Michigan Federation became more involved in issues beyond the Lake Michigan watershed. In 1982, the National Wildlife Federation established a new Great Lakes Resources Center in Ann Arbor, Michigan, to take legal action and work on policy development.[313] Work by various Canadian groups on Great Lakes issues included a publication of a number of reports by the Canadian Institute for Environmental Law and Policy.

In the U.S., opposition to the Army Corps of Engineers winter navigation project to promote year-round shipping helped expand the Great Lakes environmental community that had formed around the Water Quality Agreement. In 1978–1979, a group called Save the River, from the Thousand Islands region in New York, formed an alliance with the Michigan United Conservation Clubs (MUCC). The expansion of the environmental network inspired the MUCC decision to organize the binational coalition that became Great Lakes United.[314]

The threat of efforts to divert water from the Great Lakes to the American West or Southwest was also a unifying issue for virtually the entire Great Lakes community. Acid rain was another issue outside the Water Quality Agreement that brought together Great Lakes activists across the boundary on what was initially considered primarily a Canadian issue. Ontario established a lobbying organization in Washington to work with U.S. environmentalists for acid rain controls in U.S. law.[315]

Toxic contamination was the issue most directly related to the Agreement that inspired new advocacy in this period. The Great Lakes groups found new allies in the local organizations that were developing around hazardous waste disposal controversies in both countries.[316] Much of the scientific evidence cited in opposition to siting of landfills or incinerators was based on Great Lakes research. Manno tells how Pollution Probe of Toronto worked with the Ecumenical Task Force to organize residents of the Love Canal region.[317] That work eventually led to the intervention of Canadian groups in the litigation concerning the clean-up of the sister sites to Love Canal.[318]

The anti-environmental views of the national administrations in both countries also brought advocacy organizations together. The Lake Michigan Federation and other groups had protested funding cuts for Great Lakes programs through the 1970s. In the 1980s, U.S. environmental groups joined the Northeast-Midwest Institute and the new Center for the Great Lakes in citing obligations of the Agreement to justify maintenance and expansion of funding for Great Lakes programs.

Great Lakes United and Other Public Participation. With funds provided by the Joyce Foundation, about 50 persons gathered at the Grand Hotel on Mackinac Island in May

1982 to consider MUCC's proposition for formation of a "Great Lakes Federation." They included representatives of the United Auto Workers in addition to staff and members of local and national, large and small environmental organizations.

The new binational coalition that resulted was called Great Lakes United and soon became a major new force in Great Lakes advocacy after surviving acrimonious controversy between factions with differing concepts of its structure and operation.[319] While organizations within the coalition took the lead on certain activities, agreement was reached on policy positions in GLU annual meetings. The biennial meetings of the IJC provided an even larger forum for interaction with scientists, agency officials, and representatives of other Great Lakes institutions.

The Sierra Club, which has more freedom for lobbying under U.S. tax law, took the lead in lobbying for legislation.[320] Members of other organizations in the coalition, usually including some Canadians, participated through a new institution known as Great Lakes Week. The Coast Alliance, a national coalition of environmental groups concerned with marine shorelines and the Mississippi, used Great Lakes information and involved members of Great Lakes environmental groups in lobbying USEPA to create national policy and a program on contaminated sediments.[321]

Beginning in 1986, about two dozen volunteers and staff of Great Lakes organizations received training in lobbying techniques and briefing on current issues at the Sierra Club office in Washington, D.C. in each Great Lakes Week. Over several days, they then met with members of the Great Lakes Congressional delegation and participated in meetings with officials of USEPA, the State Department, and other agencies.[322]

Contact was then maintained through the year in a Great Lakes Washington Report that tracked legislative and budget developments and encouraged continuing contacts with members of Congress on specific legislative proposals. Encouraged by their members from the Great Lakes region who participated in Great Lakes Week and Great Lakes United, the Washington offices of other national environmental organizations began to give more attention to the Great Lakes.[323]

Legislative victories resulting from this process included the adoption of an amendment to the 1987 Clean Water Act whose purpose was to respond to the ongoing reluctance of the Washington headquarters of USEPA to give priority to Agreement goals. Section 118 codifies the Great Lakes Agreement into U.S. law by stating that "It is the purpose of this section to achieve the goals embodied in the Great Lakes Water Quality Agreement . . . through improved organization and definition of mission on the part of the Agency, funding of state grants for pollution control in the Great Lakes Area, and improved accountability for implementation of such agreement."[324]

In 1990, still dissatisfied with the agency's performance, Michigan Senator Carl Levin sponsored a further amendment known as the Great Lakes Critical Programs Act.[325] Implications and consequences of this legislation are discussed in the history of the third phase of the Agreement from 1987 to the present.

Great Lakes United took the lead in supporting the development of the Great Lakes Charter on diversion adopted by the states in 1985 and the subsequent Toxic Substances Agreement in 1986. The growing political strength of the environmental coalition was acknowledged from the mid-1980s by inclusion of environmentalists in an informal annual meeting of Great Lakes leaders convened by the Center for the Great Lakes.

While the advocacy capacity of citizen organizations on behalf of the Great Lakes was growing outside the IJC process through the 1980s, public involvement with the IJC was also expanding, especially in the IJC biennial meetings. The public information policy adopted in 1980 included guidelines for the IJC annual meeting, which was described as "the most important public information event of the year."[326]

The greatest expansion of participation began with the first biennial meeting in 1983. Attendance at the annual meetings from 1975 to 1982 had gradually increased from 135 to about 400.[327] The 1983 biennial meeting in Indianapolis was the first to be called "a circus" by some participants.[328] The comment referred to the lack of attention to the advisory board

reports that had been the main focus of previous meetings and the emphasis on side events and entertainment of participants.

The Indianapolis meeting was also the first, and to date, the only IJC meeting to be held outside the Great Lakes basin. To increase attendance by citizens, the IJC provided funds for chartered buses from various locations. The location was selected by Keith Bulen, who had been named an IJC Commissioner by President Reagan after serving as his state campaign committee chair in the 1980 election. The local Republican Party women's committee was recruited to involve local residents and provide hospitality for out of town visitors.[329]

The agendas for the 1985 meeting in Kingston, Ontario, and the 1987 meeting in Toledo, Ohio, were more traditional but still attracted significant attendance. The WQB board reports continued to be regarded as "state of the lakes reports" and received widespread coverage by the news media. The practice of requiring questions from the audience to be submitted in writing inspired growing resentment from environmentalists.[330]

As environmentalists followed the information on toxic contamination in IJC reports and other scientific sources, including the NRC/RSC report, through the 1980s, their criticism grew about the lack of government action to achieve the ecosystem approach to management or elimination of toxic contaminants called for in the Great Lakes Agreement. Discussions began at the Toledo meeting about how to increase public involvement in the next biennial meeting to be held in Hamilton, Ontario, in 1989.[331]

Expansion of Foundation Support. Both the capacity of the environmentalists to organize and the growth of Great Lakes institutions in this decade were fostered by support from regional philanthropic foundations. The Chicago-based Joyce Foundation began operating in 1976 with assets that make it one of the larger philanthropic institutions in the U.S. The foundation devotes most of its resources to the Midwest. In 1981, the foundation decided to commit major resources to a ten-year program to promote regional advocacy for the Great Lakes and economic diversification in the region.[332]

One of the first activities was a 1981 conference to encourage other Midwest foundations to undertake similar programs of their own. Since then, the George Gund Foundation of Cleveland, the Charles Stewart Mott Foundation of Flint, Michigan, and the Joyce Foundation have continued to provide major funding to numerous Great Lakes environmental organizations, institutions, and special projects in the U.S. and Canada.

The Laidlaw Foundation of Canada is another continuing participant on a smaller scale. Through the middle 1980s, both the Canada Donner Foundation and the U.S. Donner Foundation also supported Great Lakes projects. The Johnson Foundation increased its support for meetings on Great Lakes issues. Its Wingspread Conference Center at Racine, Wisconsin, continues to be the site of numerous discussions of Great Lakes issues with significant results.[333]

The ongoing interest of these regional foundations also appeared to increase the willingness of other foundations to fund activities in the Great Lakes region.[334] The new interest and availability of funding both strengthened the capacity of existing institutions and regional environmental organizations and led to the establishment of new ones. The funding also helped stimulate new interest from the national environmental organizations in Great Lakes issues.

A major theme of the 1981 Joyce Foundation conference was the need to increase the capacity for coordination, in part to replace the coordination among the states that had been provided by the Great Lakes Basin Commission. The idea that emerged from the conference for a binational center for policy research that would address both environmental and economic development issues led to the establishment of the Center for the Great Lakes. The center had offices in Chicago and Toronto and former Michigan Governor William Milliken as president, but ceased operation in 1993.

The Joyce Foundation also assisted establishment of the Council of Great Lakes Governors, which seeks to engage Ontario and Quebec on issues of binational significance.

In the mid-1980s, a proposal to create a unique permanent regional endowment of state funds to benefit the Great Lakes emerged from the Center for the Great Lakes and the governors council.[335] Efforts to set up a similar fund in Canada have not been successful to date.[336]

The Great Lakes Protection Fund was established with an endowment of $100 million. The contribution from each state was determined by a formula that considered the population of the state that depends on the Great Lakes for drinking water and total withdrawals for other purposes. To date, seven of the eight states (Indiana is the exception) have made all or part of their contributions for more than three-quarters of the total.

In Washington, the Northeast-Midwest Institute was established as a not-for-profit research agency to assist the Congressional delegations from these regions. A special Great Lakes Task Force with members from the Great Lake states continues to provide assistance to bipartisan efforts within the Congress on behalf of the Great Lakes.[337]

In 1982, the Joyce and U.S. Donner foundations funded a third interuniversity seminar, to be managed by Northwestern University and the University of Toronto. Faculty members from 24 universities attempted to define the elusive "ecosystem approach to management" called for in the 1978 Agreement.[338] In 1983, seminar discussions inspired Philip Jessup of the Donner Foundation staff to propose an assessment of progress under the Agreement by the Royal Society of Canada and the National Research Council of the U.S. National Academy of Sciences.[339]

Funded by both Donner foundations, the first joint study by the two preeminent scientific bodies of both countries covered both scientific and institutional issues. The study's final report in 1985 stated that residents of the Great Lakes basin are exposed to "more toxic chemical burden" than the residents "of other similarly large regions of North America."[340] This controversial conclusion received more news media coverage and more attention from all Great Lakes agencies and institutions than any other aspect. The report also raised the question of "intergenerational equity" in discussing cleanup of the Great Lakes as an issue of sustainable development.[341]

The NRC/RSC report helped inspire a second major binational study by the Conservation Foundation in Washington, D.C., and the Institute for Research on Public Policy (IRPP) of Ottawa "to assess environmental conditions and trends and the adequacy of government programs."[342] The study was funded by many foundations as well as Canadian government agencies and numerous industries.

The result was a book titled *Great Lakes, Great Legacy?* that provided the most complete information to date on the implications for human health of the presence of toxic contaminants in the Great Lakes and, by implication, everywhere on the globe.[343] The book did not agree with the NRC/RSC report that residents of the Great Lakes basin carry a greater toxic burden than persons elsewhere. Its integration of information from many sources developed by numerous scientific disciplines, however, initiated ongoing research that continues to expand understanding of health effects for humans and wildlife from exposure to manufactured chemicals in the environment.[344] As the Conservation Foundation/IRPP project

was being carried out, new negotiations resulted in additions to the Great Lakes Agreement that are called the "1987 Protocol."

Summary of Progress Under the 1978 Agreement

Following adoption of the 1978 Agreement, progress continued toward reduction of phosphorus loadings and increased understanding about toxic contamination and its effects in the Great Lakes ecosystem. Through the 1980s, scientific research continued to disclose the problems toxic contaminants could cause for aquatic life, wildlife, and humans. Although monitoring disclosed some decline in levels of PCBs, improvements due to reduction of toxic contamination were not visible as they had been with reductions of phosphorus loadings.[345]

PCBs continued to be a major problem because of their pervasiveness and chemical stability. The SAB continued to try to determine which of the nearly one thousand different toxic chemicals that had been reported in the Great Lakes posed the most danger.[346] Eventually agreement was reached on a list of eleven critical contaminants that continue to be the principal targets for virtual elimination.[347]

The early concentration of attention on the kinds and numbers of contaminants was followed by more attention to effects. Tumors in both bottom-feeding and wide-ranging fish were linked to exposure to polyaromatic hydrocarbons in sediments.[348] Birth defects and reproductive disorders in birds and mammals were found to be associated with exposure to dioxins and other chemicals.[349] By the early 1980s, a connection had been shown between blood levels of PCBs in humans and consumption of certain fish from Lake Michigan.[350]

Nongovernmental involvement continued to grow as scientists, government officials, and IJC members and staff joined in considering how to apply an ecosystem approach to management. Major events where an ecosystem approach was the topic included the workshop organized by Great Lakes Tomorrow under an IJC contract in 1983, a third interuniversity seminar from 1982 to 1984, and the NRC/RSC study 1984 to 1985.[351]

As another review of the Agreement was being considered in the mid-1980s, through its growing binational network, Great Lakes United took the lead to involve citizens in considering what needed to be done about the growing dissatisfaction of environmental organizations with government action to control toxic contaminants. When a new review began in 1986, all sides agreed that the fundamental features of the Agreement that had been adopted in 1978 should be preserved, even though changes were needed to achieve more effective control of toxic contamination.

3.3 Phase 3: The 1987 Protocol: Evolution of the Great Lakes Agreement from 1987 to 1995

The profound changes in the Great Lakes regime that occurred following the adoption of the 1987 Protocol were not anticipated in the early part of this phase of evolution of the Great Lakes Agreement. As the Protocol was being developed, the influence of the environmental community appeared to be increasing with the participation of its representatives in the review and then in the actual negotiation of changes. Legislation and programs in both countries gave new recognition to the problem of toxic contamination in the Great Lakes, but environmentalists remained dissatisfied because the new programs would not achieve virtual elimination or zero discharge.

As the result of advance organizing by an environmental coalition, the 1989 biennial meeting at Hamilton, Ontario, was virtually taken over by demands for stronger action against toxics. At the end of the 1980s the political influence of the Great Lakes regime seemed to be growing in both countries. The power of citizen involvement seemed to be confirmed by the precedent-breaking recommendations on toxic contaminants, in particular chlorine, by the IJC in its Fifth, Sixth and Seventh biennial reports.

Neither the substantial withdrawal of Environment Canada and USEPA from the binational process managed by the IJC in the early 1990s nor the changes that the IJC would make in its own internal processes in the same period were anticipated. By 1993, the chemical industry had organized its response to the threat of a chlorine ban and its representatives were almost as numerous and even more vocal than environmentalists in IJC affairs.

By 1994, a new North American agency for the environment had been created whose authorities overlap with those of the IJC. By 1995, environmental groups were preoccupied with their own organizational problems and the conservative governments in both countries with fiscal problems that included potential major cutbacks in funding for environmental programs. Some of the foundations whose support had been essential to so many Great Lakes institutions initiated a process to help rebuild the capacity of the

environmental community but were also assessing their Great Lakes programs. As this review was completed in 1996, the future of the Great Lakes Agreement was more uncertain than at any time since the Agreement was adopted in 1972.

The General Political Context

Conservative views prevailed in the governments of both countries as the new Protocol was developed. There is no doubt that Prime Minister Brian Mulroney and President George Bush intended the "special relationship" between Canada and the U.S. to continue. Former vice-president George Bush succeeded Ronald Reagan as president in 1988 and appointed a new panel of IJC members, naming his campaign chairman in Indiana, Gordon Durnil, as U.S. co-chair. In Canada, and less so in the United States, concern about environmental consequences divided public opinion about the U.S.--Canada Free Trade Agreement (FTA) that was signed in 1988. The difficulties of the Canadian economy at this time continue in the mid-1990s.[352]

In 1989, soon after William Reilly became head of the USEPA, he announced that the agency would use the Great Lakes experience as a model for a new approach to policy based on preservation of ecological integrity.[353] This action gave the Great Lakes Water Quality Agreement more acceptance in the agency headquarters than it had ever had.[354] The already considerable political power of the Great Lakes was reinforced when members of the Great Lakes Congressional delegation noted the insistence of more than 800 citizens at the Hamilton meeting that steps be taken to meet the Agreement's objective of zero discharge of toxic contaminants.[355]

Members of the National Wildlife Federation, backed by members of smaller groups throughout the Great Lakes region, led the lobbying for the 1990 Great Lakes Critical Programs Act.[356] The law reinforced the directive to USEPA in Section 118 of the 1987 Clean Water Act that the agency's programs recognize the objectives of the Agreement by setting deadlines for several programs required under the 1987 Protocol. Funding for the Great Lakes National Programs Office was increased. The federal environmental agency now had a legislative mandate for Remedial Action Plans, Lakewide Management Plans, for five major demonstration projects on technology for removing contaminated sediments in five Great Lakes harbors and for providing guidance to the states for adopting water quality standards consistent with the virtual elimination requirement of the Agreement.

The Water Division of USEPA Region 5 had initiated development of the Great Lakes Water Quality Initiative, later called the Great Lakes Initiative (GLI), in 1989 by setting up a task force of representatives of the Region 2 and 3 offices in New York and Philadelphia, respectively, and of state environmental agencies. An advisory committee was established with co-chairs representing the environmental community and industry interests. The federal agency sought a new regulatory approach for chemicals that bioaccumulate in organisms and are called "persistent" because they do not break down in the environment as conventional organic pollutants do. The approach recognized the ecological aims of the Agreement by requiring that harm to wildlife and threats to human health be considered as well as danger to aquatic life.

Sued by the National Wildlife Federation for missing the statutory deadline for completing the complex regulatory process, USEPA finally promulgated the GLI guidance in 1994. The states were given a March 31, 1997 deadline for making their water quality standards consistent with the federal requirements. Industry interests set up the Great Lakes Water Quality Coalition, or Great Lakes Coalition, to organize opposition to the GLI because of fear that the approach might be applied nationally if adopted in the Great Lakes.

As the GLI was getting underway, strengthening of Section 112 of the 1990 Clean Air Act under the Sierra Club's leadershipwas based substantially on legislation originally introduced to address problems with atmospheric deposition in the Great Lakes.[357] Agreement obligations were also used in 1990 to explain the ecosystem-approach-to-

management principle of a new Great Lakes Fish and Wildlife Restoration Act.[358] All the new Great Lakes legislation specified regular reports to Congress on progress.

In 1988 the Canadian federal government had combined five statutes into a new Canadian Environmental Protection Act (CEPA). Part II required assessment of the toxicity of substances as a precondition for the government to act on controls.[359] One of the most controversial federal initiatives was the imposition of effluent limits for the pulp and paper industry, including limits for organochlorine discharges.[360] Not surprisingly, Great Lakes activists lamented that the regulations were not sufficiently stringent to meet the goal of virtual elimination under the GLWQA.[361]

Implementation of the Ontario water quality program, MISA, moved slowly but technology-based effluent regulations for the large direct dischargers commenced with petroleum refineries in the early 1990s, with eight other sectors following by 1994.[362] Again, the pulp and paper effluent regulations, passed in 1992, were the most controversial since they aimed for the zero discharge of organochlorines.[363] In announcing the tough new limits, the Ontario Environment Minister relied heavily on information developed for the Agreement through the IJC.[364]

In spite of the apparent acknowledgement of its importance, the Great Lakes Water Quality Agreement was ignored in the 1991 U.S.--Canada transboundary air quality accord on bilateral reductions of the emissions that cause acid rain.[365] Neither the governments nor the IJC had responded to suggestions from the academic and environmental communities that an ecosystem approach would seem to require coordination in implementation between the water quality and air accords, which could be provided through the IJC.[366] The only role assigned to the IJC was to organize public hearings on progress under the acid rain agreement.[367]

Meanwhile, the USEPA undertook new initiatives to encourage voluntary pollution prevention by major industries in the Great Lakes region, including automobile manufacturing and steel production.[368] The Council of Great Lakes Governors worked for the same ends with the printing industry.[369] Industry representatives support the new policy trend on the grounds that it allows more flexibility to control pollution efficiently. Some environmentalists consider reliance on voluntary reduction and prevention of pollution to be a retreat from essential use of regulatory powers.[370] The trend continued to gain importance at USEPA after William Clinton was elected president in 1992, especially when Republican leaders sought to reduce funding for environmental programs after they gained control of Congress in 1994.

By 1993, the issue of trade again dominated the U.S.--Canada bilateral relationship. Questions about the environmental consequences of the North American Free Trade Agreement (NAFTA) between Canada, Mexico, and the United States led to a side agreement establishing a new trilateral North American Commission on Environmental Cooperation (NACEC), now called the Commission on Environmental Cooperation (CEC).[371] Although the CEC is a new institution with fairly limited powers, its actions have been gaining more visibility and attention, in part because the heads of the national environmental agencies of all three countries form the governing council of the agency.

Although the CEC is addressing issues of importance to the Great Lakes including transboundary transport of air emissions, and a 1995 resolution called for the elimination or reduction of four major toxic substances in all three countries, no role was assigned to the IJC in the trilateral agreement.[372] To date there has been no formal meeting between the two commissions to coordinate work plans.[373]

By 1995, major struggles were also underway in both countries over deregulation, including the weakening of the federal role in environmental protection. In the U.S., the Republican leadership that assumed control of Congress in 1994 attempted to weaken all the federal environmental programs established by laws adopted since the 1970s, including the Clean Water Act. By 1996, a backlash had developed in response to strong public support for environmental programs, and the environment appeared to be a stronger factor in the Presidential and Congressional elections than ever before. Nevertheless, it appears

likely that a second Clinton administration will continue to return more authority to the states for implementation of environmental laws than they have had at any time since the Great Lakes agreement was first signed in 1972.

In Canada, the deregulation agenda, both federal and provincial, appears likely to go further than in the U.S. because of the major decline in government fiscal resources. At the federal level, dramatic downsizing of Environment Canada (an over 30 percent reduction in staff from 1994 to 1997) continues to challenge the agency to do more, or even the same, with less. A "harmonization agreement" endorsed in late 1996 between the provinces and the federal government has been a source of controversy since the first draft was released in 1993.[374]

The proposed agreement has broad implications for standard-setting and policy-making in Canada. The environmental community has argued that the provinces will become responsible for setting environmental standards and even enforcement of federal laws.[375] Nevertheless, the influence of Great Lakes policy innovations were evident during the parliamentary review of the Canadian Environmental Protection Act when the federal responsibility for meeting binational obligations was acknowledged.[376]

At the provincial level, the budget of the Ontario Ministry of the Environment and Energy is also scheduled for reduction by more than 35 percent between 1996 and 1997. The Ontario government has undertaken an ambitious regulatory reform by rewriting statutes and consolidating the 80 environmental regulations into 47 regulations.[377] One target for change is the zero discharge goal in the pulp and paper regulations.

As in the U.S., both federal and provincial governments began putting increasing emphasis on the voluntary approach with industry. In fact, despite the skepticism of the environmental community, regulation seemed to be giving way to voluntarism, such as memorandums of understanding and emission reduction challenges. In mid-1996, the Ontario government proposed a regulatory code of practice where voluntary measures would be considered first before any regulations are made.[378]

As the 1990s proceeded, the focus of attention within the environmental sector was changed from ambitious forging of new concepts and policies to struggle to retain existing laws, policies, programs and institutions. Regardless of the outcome, the fact that fewer government resources were now committed to environmental protection than a decade previously had major implications for addressing new priorities, continuation of scientific research, and maintenance of effort to achieve the goals of the Great Lakes Agreement.

Growing Evidence of Harm from Toxics

While environmental programs were being challenged in this period, evidence continued to accumulate about the effects of persistent bioaccumulative toxic contaminants in the environment and for human health. In the 1970s initial concern about the cancer-causing effects of exposure to toxic contaminants for humans seemed to be supported by the discovery of wide-spread fish tumors.[379] Ongoing research throughout the world continues to disclose links between exposure to dioxin and other substances and birth defects and reproductive failure, with increased understanding of immune system suppression and other hormone-like effects of toxic contaminants on wildlife, and potentially on humans. A background paper on toxic contaminants prepared for the 1994 State of the Lake Ecosystem Conference in 1994 reported that in the Great Lakes reproductive or other problems attributable to toxic contaminants have been documented for eleven species.[380]

In 1996 the results of research on development of infants born to mothers who had high levels of PCBs in their bodies due to consumption of fish from Lake Ontario were reported to be consistent with the ongoing Jacobson studies that show developmental effects due to maternal consumption of Lake Michigan fish with high concentrtions of PCBs.[381] Major scientific consensus on the gravity of the problem that the endocrine disruption effects of certain toxic substances poses for for humankind is shown by the 1991 Wingspread consensus statement of twenty renowned scientists.

In 1996, following a workshop in Erice, Italy, an international group of scientists issued a new consensus statement about the effects of exposure to certain industrial chemicals on development of the brain and nervous system.[382] A few weeks earlier, an article published in *Science* magazine seemed to confirm the validity of the language concerning additive effects that had been added in the 1987 Protocol. This article reported on research that showed that the effects of combinations of hormone-disrupting chemicals were far more dangerous than the effects of exposure to single chemicals.[383]

While scientific uncertainties remain, what was thought to be a potentially serious environmental problem for the Great Lakes in the 1970s has become a serious human health issue that may explain multifold increased cancer risks, learning disabilities, and even behaviorial problems for industrial society. The IJC's biennial reports in the first half of the 90s decade reflected this growing catalogue of evidence of the problems associated with persistent toxic substances.

No longer quoting entirely from advisory board reports and citing public concern, the the reports had a new tone of urgency about the need to address toxic problems. The Fifth Biennial report concluded that "there is a threat to the health of our children emanating from our exposure to persistent toxic substance."[384] The Sixth Biennial report concluded that humans are "in danger" from these substances[385] while the Seventh Biennial report concluded that "there is sufficient evidence now to infer a real risk of serious impacts in humans."[386] Citing that the evidence of the dangers of persistent toxic substances is being reinforced, the Commission in its Eighth Biennial report concluded that such evidence justified concerted and effective action.[387]

With reductions in direct discharges, contaminant concentrations in 1996 generally met the 1978 objectives in the open waters of the lakes but remained higher in the tissues of fish and birds.[388] The fact that bald eagle reproduction continues to be less successful on the shores of the Great Lakes than inland confirms that the ultimate Agreement objective of waters free of substances harmful to human, animal, or aquatic life has not been achieved.[389]

The evolution of the Great Lakes regime is related to the pace of research and growth of public understanding and concern about the toxic contaminants in the environment. Toxic contamination was the chief reason for increased public participation in the biennial meetings as well as the new involvement of industry in IJC processes. In the same period, emerging new issues that competed for attention included new invasions of exotic species, especially the zebra mussel, and the need for preservation of habitat and biodiversity. This period of profound change began with negotation of the 1987 Protocol.

Negotiation of the 1987 Protocol

The advance consultation, review, and renegotiation that produced the 1987 Protocol was far more open and inclusive than the closed process for the 1978 Agreement that essentially had included only government officials. This time, five nongovernmental observers from environmental organizations participated in the final negotiation. USEPA also consulted with the states as a draft U.S. position was being prepared. In the final negotiations, the states were represented by participants from Michigan, Wisconsin, and New York. The Canadian negotiating team included two representatives of Ontario and one from Quebec.

The governments also considered three external sources of commentary and recommendations: the study of the Royal Society of Canada and the National Research Council of the United States, the report by Great Lakes United based on public hearings throughout the basin, and the Third Biennial Report of the IJC. The first two especially were referred to often in the actual negotiations. All three of the advance reviews agreed in urging that the 1978 Agreement should be continued but that amendments were needed to strengthen it. The detailed recommendations of the RSC/NRC report covered Agreement objectives, joint programs, the advisory boards, the Regional Office, the role of the IJC

and the parties, and responsibilities of the parties both for implementation and communication with the public.

The Great Lakes United report, *Unfulfilled Promises*, which resulted from 19 citizens' hearings attended by 1,200 persons around the basin, emphasized the need for faster and stronger efforts to control toxic contamination and for more involvement of and accountability to the public for actions by the governments. A recommendation that the concept of zero discharge of toxic contaminants, already in the Agreement, receive more explicit attention in water quality management programs and schedules for achievement laid the groundwork for a later campaign, spearheaded by GLU, for zero discharge. Both the NRC/RSC and the GLU reports urged that a Citizens Advisory Board for the Agreement be created and that nongovernmental representatives be included on the WQB.

The IJC's Third Biennial Report to the governments drew upon the other two documents in urging that the coming renegotiation "clarify, strengthen, and support the various provisions of the 1978 Agreement."[390] While acknowledging that the less than satisfactory progress under the Agreement was due in part to unrealistic timetables and objectives, the IJC nevertheless urged the governments to expand their efforts for point source discharges, air quality, contaminated sediments, wetlands, and monitoring. The theme that ran through all three reports was that the parties should try harder and be more accountable for their efforts on behalf of the Agreement's goals. This report was the IJC's only opportunity to contribute to the negotiation.[391] The Commission was not asked to comment on draft versions or the final language of the 1978 Agreement.[392]

As before, Canada's Department of External Affairs and the U.S. State Department formally oversaw the process but deferred to Environment Canada and the USEPA throughout. The two environmental agencies began by each proposing their own amendments in the spring of 1987. Following exchange of drafts over the summer, they had reached substantial agreement before the formal negotiations began in October. The final version reflected changes that each side had wanted as well as concessions made to each other.

Canada-U.S. Positions. Canada initially proposed far more detailed amendments for both the body of the Agreement and Annex 1, most of which were not agreed to for the final version. Canada also first proposed the addition of human health concerns, which was accepted by the U.S. in the final version.

Canada thought the Specific Objectives of Annex 1 should be strengthened by adding objectives for six substances but instead agreed to the U.S. proposal instead to include a process for updating the objectives. The U.S. proposed to add a requirement for Lakewide Management Plans (LAMPs) as well as Remedial Action Plans (RAPs) and Canada agreed. Both sides added topics as annexes, including contaminated sediments, nonpoint source pollution, and airborne toxics.

For the joint institutions, the U.S. proposed to strengthen the role of the WQB by allowing the board, rather than the IJC, to make final decisions on designating areas of concern and "approval" of LAMPs and RAPs. Some U.S. agencies joined Canada in viewing this proposal as a weakening of the IJC. In the end, the federal governments were given approval power with the IJC allowed to "review and comment."

Echoing earlier USEPA objections to federal funding of more advanced treatment systems to meet Agreement requirements, Canada proposed to amend Article II to remove the federal obligation to help finance publicly owned treatment plants. This proposal was not supported on the U.S. side and was dropped because of opposition from Canadian environmental groups.

The Role of NGOs. In addition to the advance hearings and the report Unfulfilled Promises, over the summer of 1987 Great Lakes United and other environmental groups tracked the preliminary development of the Agreement and organized pressure for the inclusion of environmental representation in the final negotiation. The environmental

community on both sides of the border stressed the need to achieve the objectives of the existing Agreement and to make any changes primarily through the annexes and supplements.

The lack of industry attention reflected this sector's limited participation in the Great Lakes community in the first two decades. After the Soap and Detergent Manufacturers Association and companies such as Proctor and Gamble of Ohio opposed phosphate detergent bans in the 1970s, industry had little presence in Agreement-related activities until the early 1990s. The interest of the chemical industry in both countries was stimulated by the IJC's recommendations on chlorine and the interest of industries in the U.S. who require discharge permits by the GLI debate.[393]

The environmental groups mainly sought to increase the accountability of the governments for efforts and progress toward achievement of the objectives of the GLWQA. They also wanted more public participation in identifying additional areas of concern, which would mean additional RAPs, and new annexes on contaminated sediments, groundwater, nonpoint sources, and atmospheric contaminants. They urged the inclusion of the St. Lawrence River and again proposed the appointment of NGO members to the WQB.

At the end of September Great Lakes United, the Sierra Club, and the National Wildlife Federation were invited to provide U.S. NGO observers for the final negotiation. They were respectively Tim Eder, Jane Elder, and Mark van Putten. In Canada, John Jackson and Kate Davies of Great Lakes United were also invited. Although officially only observers, they participated directly in discussion during a formal bilateral negotiation session on October 16, 1987.

Final Negotiation. Quick agreement was reached on several changes proposed by the NGOs, including ecosystem objectives for the St. Lawrence and connecting channels, and a requirement for public consultation on RAPs and LAMPS. Addition of the words "singly and in combination" or "synergistic or additive" was also accepted wherever toxic contaminants are mentioned.

Issues that had to be resolved included mixing zones, the relationships between dredging and sediments, and an annex on airborne pollution. Controversial language for what had been called "limited use zones" was changed to "point source impact zones." The title "Airborne Toxic Substances" was finally agreed to in order to avoid what appeared to be U.S. concerns that the GLWQA might be used to strengthen the Canadian push for stricter control of acid rain sources.[394] Ambiguous language also resolved differences between the parties on dredging. After final review and formal approval by the governments, the result was adopted and signed on November 18, 1987, at the IJC meeting in Toledo, Ohio.

Key Provisions of the 1987 Protocol. Most of the changes in the 1987 Protocol added to or reinforced provisions of the 1978 version, except for those relating to the role of the parties and the relationship between the parties and the IJC. Table 6 outlines the changes.

The two most important changes were the new reporting process for the lead federal agencies called for in Article 10 and the provisions in Annex 1 for how the parties would pursue the specific objectives. New annexes also called for the development of RAPs and LAMPs, in addition to the requirements of other annexes.

The thrust of the new language of the Protocol was to provide that the lead agencies of the parties should pursue joint activities on behalf of the Agreement and communicate with each other directly rather than through the IJC. This change in relationship was acceptable to the agencies because of commonly held views that participation in the joint institutions managed by the IJC, especially the committee structure of the advisory boards, consumed too many resources that might better be used otherwise.[395] The nongovernmental observers believed the new language would make the governments more accountable for results.[396]

TABLE 6

Key Amendments to the GLWQA by the 1987 Protocol

	Section	Description of New Section
Specific Objectives	III (f)	-Commitment of Parties, in cooperation with States and Provinces, to work toward the elimination of Areas of Concern, Critical Pollutants and Point Source Impact Zones under Annex 2;
Standards, Regulatory Measures and Research	V	- Parties to undertake best efforts to ensure "research priorities are undertaken in accordance with Annex 17"
Programs and Other Measures	VI	- Parties commit to such programs "in cooperation with State and Provincial Governments"
	VI(1)(e)(ix)	- amendment to recognize new non-point annex 13
	VI(1)(l)	- amendment to change subheading to airborne toxic substances and recognize new air annex 15
	VI(1)(n)	- -amendment to recognize Remedial Action Plans in annex 2
	VI(1)(o)	- amendment to recognize Lakewide Management Plans in Annex 2;
	VI(1)(p)	-new subsection on contaminated sediments with recognition of new annex 14;
	VI(1)(q)	- new section on contaminated groundwater and recognition of new annex 16.

Consultation and Review	X(3)	- provision added requiring Parties, in cooperation with states and provinces, to meet twice a year to coordinate their work plans with respect to implementation of the Agreement and to evaluate progress made
	X(4)	- agreement to be reviewed after every third biennial report
Specific Objectives to Supplement Annex 1	Annex 1	- supplement to annex 1 to include: (a) objectives development process; (b) a review process for a biennial review of objectives; (c) establishment of an ecosystem objective for Lake Superior
Remedial Action Plans and Lakewide Management Plans	Annex 2	- revised annex 2 that: (a) designates Areas of Concern; (b) development of Remedial Action Plans; (c) designates Critical Pollutants; (d) development of Lakewide Management Plans; (e) designation of Point-Source Impact Zones
Discharges from Vessels	Annex 4	-various revisions
Review of Pollution from Shipping Sources	Annex 6	-various revisions
Joint Contingency Plans	Annex 9	-various revisions
Hazardous Polluting Substances	Annex 10	-addition to provisions including maritime pollutants from International Maritime Organization

Surveillance and Monitoring	Annex 11	-revisions to include: (a) surveillance and monitoring activities to support Annex 2 programs; (b) defined expansion of programs; (c) development of ecosystem health indicators for the Great Lakes
Persistent Toxic Substances	Annex 12	-revision to include additional principle to reduce waste production
Pollution from Non-Point Sources	Annex 13	NEW ANNEX
Contaminated Sediment	Annex 14	NEW ANNEX
Airborne Toxic Substances	Annex 15	NEW ANNEX
Pollution from Contaminated Groundwater	Annex 16	NEW ANNEX
Research and Development	Annex 17	NEW ANNEX

Changes in the Regime Since the 1987 Protocol

To many observers, the changes in the 1987 Protocol appeared less profound than the substantial expansion of aims that had occurred between the 1972 and 1978 versions of the Agreement, when the emphasis shifted from phosphorus control to elimination of toxic contaminants from the ecosystem. Nevertheless, since the 1987 Protocol was adopted, more change has occurred in the relationship between the lead agencies for the parties and the IJC and in the part that the agencies play in the binational institutions and activities than in any other period since 1972.

Some observers have blamed the 1987 Protocol itself for these changes.[397] John Gannon, former staff member of the regional office, has stated that "the changes [in the Protocol] were made purposely by the Parties to weaken the IJC."[398] This review has found that many of the changes in the role of the Commission and in the operations of joint institutions since 1987 are due more to how the changes in language were interpreted than to what the words require or the negotiators intended. Moreover, some of the changes likely would have occurred even without the 1987 Protocol because they resulted from the views of Commissioners who took office later.

As the changes discussed below were developing inside the regime, new external factors that may affect decisions in the 1999 review were becoming apparent. They included new concerns about the environmental consequences of a global economy, the decline in fiscal resources of the national governments, and shifting political winds. The zebra mussel invaded the Great Lakes ecosystem about the time the Protocol was negotiated and invasion of this and other exotic species has become a major concern. Meanwhile, new attention was being given to habitat protection and biodiversity even while new information about potential threats to human health from toxic contaminantswas almost constantly being made public.[399]

Overview of Changes in Operations for the Parties. An important new requirement in Article X of the Protocol was that the parties, represented by the lead agencies Environment Canada and USEPA, should consult directly with each other instead of through the IJC. The new requirements did not abolish the previous practices by which many of the contacts of agency staffs and administrators with each other as well as IJC staff were through the IJC advisory boards and their committee structures. Interpretation of the 1987 Protocol led to the establishment of new institutions by the agencies, who now participate much less in the advisory boards and the IJC biennial meetings.

The agencies now have their own biennial SOLEC meeting that is independent of the IJC. The stated intention in forming SOLEC was to complement the IJC biennial meetings by providing information that would help the IJC develop its required progress reports to the governments. Nevertheless, the Commission had no role in determining the topics to be addressed or the information developed through the 1994 and 1996 SOLEC meetings.

The SOLEC agenda is determined in the Binational Executive Committee (BEC). The BEC responds to the Protocol directive that the parties, in cooperation with the states and provinces, should meet twice a year to coordinate their work plans for the implementation of the Agreement and to evaluate progress. Chaired by USEPA and Environment Canada, the BEC includes representatives of other federal agencies on both sides. The BEC did not begin functioning until 1991 and to date the SOLEC conferences have been the main topic of its meetings.[400]

The parties, through the lead agencies, were also charged with making their progress reports directly to the Commission rather than through the WQB. The intention was to avoid possible bias on the part of agency officials who are members of the WQB. The result has been more separation between the activities that Environment Canada and the USEPA carry out on behalf of the Great Lakes and the binational activities that are coordinated through the IJC.[401] Until the July 1996 decision to open BEC meetings to observors, only government personnel attended the meetings.

To date, the BEC has not considered how to address the indicators of ecosystem health proposed by the IJC as the measure of the effectiveness of the Agreement.[402] Improvements in water chemistry, such as reductions in the levels of phosphorus or increases in oxygen, were the chief measures under the 1972 GLWQA. Much effort was made to expand the GLISP under the 1978 Agreement to track toxic contaminants in fish and animal tissues as well as the waters of the system.[403] Neither has the IJC specified information it would need in order to evaluate progress in accordance with the indicators. Meanwhile, efforts to develop and carry out a coordinated binational monitoring program such as the earlier efforts for GLISP are dormant.[404]

Overview of Changes in Operations of the IJC. It is not possible to determine definitively which of recent changes in the operations of the IJC are meant to respond to the Protocol. Some of the changes in the early 1990s appear due to views of the Commission about how its institutions should be managed rather than to the Protocol. Commission members say, for example, that operation of the library was discontinued to save overhead costs.[405] The Protocol did not require any change in the function of the WQB or disbandment of the committee structure of both the SAB and the WQB. It has been suggested that the IJC adopted the role of an advocate, another change not related to the Protocol.[406]

Elimination of the committee structure of both advisory boards, with the xoresponding change in function of the WQB to a policy advisor, was a major alteration with profound results. The resulting decrease in information exchange between agencies of the parties and IJC staff appears to give the IJC less basis for evaluating the effectiveness of government programs. Another change not mandated by the Protocol is the IJC's greater reliance on independent nongovernmental sources rather than on recommendations and supporting evidence of the advisory boards.

Changes to the IJC Related to the 1987 Protocol

With new evaluative functions assigned by the Protocol, the Commission was directed to:

1. Review progress in addressing problems in the areas of concern and to recommend designations of additional areas of concern by each party;
2. Review progress in control of critical pollutants and recommend additional critical pollutants for designation by the parties; and
3. Review the biennial reports submitted by the parties and assess them in the Commission's own biennial reports as well as by other means.[407]

A working paper by IJC staff on the implications of these changes noted that fulfilling these functions would require a clearer definition of IJC roles and additional or reallocated resources. The paper pointed out that changes in the operations of the boards, regional office, and the Commission itself would be required because the effectiveness of the increased accountability required of the parties would depend on the adequacy of IJC audits of the information submitted.[408]

The Commission responded with an "IJC Policy Statement on Its Approach to the Revised Great Lakes Water Agreement" dated September 14, 1988. It was noted that the Commission's overall workload would increase. Requests for additional funding had already been made through the budgetary process in both countries by the time the IJC's Fourth Biennial report was published.

The policy statement reviewed the IJC's traditional role as the advisor to governments. To that time, the Commission had depended on information provided by the boards to determine the state of the lakes and the extent of progress toward achieving the improved state sought by the Agreement as well as the effectiveness of the government programs in fulfilling the Agreement's purposes. The policy review also considered the functions the IJC had served under the previous versions of the Agreement, including providing a policy forum, managing all the binational activities and some coordination of

research, and the development of Great Lakes agendas by the parties. Though not intended as a directive for change, the policy statement was followed by profound alterations in the internal Commission processes and in the structure that had been established in 1972.

The strong views held by Gordon Durnil, the first U.S. co-chair following adoption of the Protocol, about his responsibilities as a manager and administrator for the Commission provided one force in the transformation.[409] Another factor was the the evolution in the relationship between the Commission and the parties, which was influenced in part by reaction to complaints from environmentalists about the perceived conflict of interest for agency representatives on the WQB and inadequate government action against toxic contaminants.

Many of the public comments at the 1989 biennial meeting in Hamilton, Ontario, criticized the WQB, an agency of the IJC, for failure to address the problem of toxic contamination. The Commission thought that the public simply did not understand that the governments, not the WQB as an IJC institution, were responsible for the implementation of the Great Lakes Agreement. This confusion was also consistently apparent to the commissioners in their day-to-day work and had been used to justify clearer delineation of roles in the language of the 1987 Protocol.

Reconstituted Task Force on Commission Role and Priorities. The formal process of reform commenced in 1989 with a Task Force on Role and Priorities established to examine the role of the Commission and the role and structure of advisory boards.[410] This original task force was reconstituted and again reviewed the operation of the IJC, including the three directives of the 1987 Protocol that are listed above. The process led to acceptance in 1991 of a *Report of the Reconstituted Task Force on Commission Role and Priorities* on the following topics.[411]

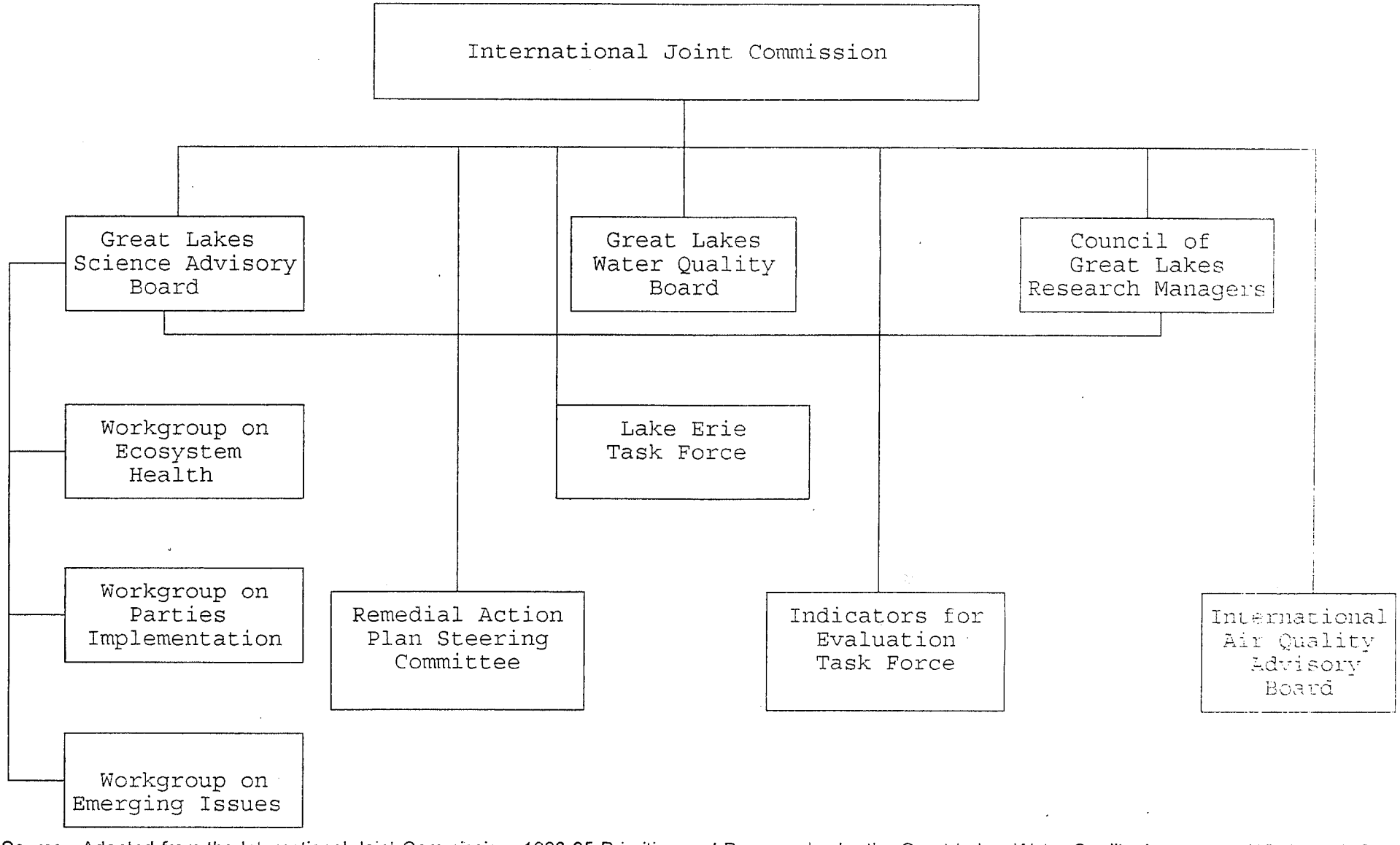
1. Establishment of a biennial planning and priority-setting process that sets the agenda for Agreement-related responsibilities, including for the advisory boards;
2. Redefinition of the functions and composition of the advisory boards, with the WQB to serve as a policy advisor; the SAB to provide advice on the issues identified in the priority setting process; and the CGLRM to track research;
3. Definition of the role of the biennial meetings;
4. Redefinition of the role of the Regional Office, which is to provide secretariat services to the boards and administrative services to the Task Forces, roundtables, and other activities initiated by the Commission;
5. Clarification of the IJC's role as reviewer of RAPS; and
6. Clarification of the IJC's public involvement purposes.[412]

While not directly defining how the IJC interprets its role under the 1987 Protocol, it called for a new division of roles and responsibilities to delineate the role of the parties—that is, the work of agency personnel wearing their agency hats—from the work of the IJC—that is, the work of the advisory boards where agency personnel are to serve in a "professional and personal capacity." As the report noted, "it is now clear to the Commission and a growing number of agency officials from both countries that government officials should no longer play both the role of implementing and assessment of progress and effectiveness of that implementation."[413] By and large, this document appears to have continued to be used as an organizational blueprint for the IJC following replacement of the Bush panel with the 1993 appointments by President Clinton. The organization of the IJC, as understood in the 1990s, is shown in Table 7.

New Priorities Setting Process. The agenda and priority setting process that the IJC has established was not called for in the 1987 Protocol. According to the minutes of a 1992 SAB meeting, Commissioner Durnil stated that the priorities process is necessary to fulfill the responsibilities of the Commission and to manage limited funding more efficiently.[414] Formerly, the boards determined their own priorities for attention and activities, although often in consultation with IJC staff and commissioners. Beginning in 1991, a Planning and Priorities Group (PPG), comprised of the commissioners, some IJC staff, and the co-

TABLE 7

Advisory Entities Reporting to the International Joint Commission under the Great Lakes Water Quality Agreement (1995)



Source: Adapted from the International Joint Commission, 1993-95 Priorities and Progress Under the Great Lakes Water Quality Agreement (Windsor 1995), p. 130

chairs of the advisory boards, has identified priorities for the IJC and each board or advisory body according to specified criteria.

One result of this change is that the boards now spend most of their time addressing issues determined primarily by the IJC and its staff as the issues to be reported on two years hence. Both boards essentially address the same issues and have less capacity to identify emerging issues or new developments that need attention. This change is especially significant for the SAB, which took initiative in the past to bring attention to issues such as atmospheric deposition and acid rain.[415] One former SAB member said that it deprives the IJC of the special expertise that a scientist might bring and also makes it less interesting for scientists who have special knowledge to participate.[416]

A board can address issues it finds to be important if the activity does not depend on IJC funding. There is, of course, little incentive for board members to actively pursue an issue if it is known that there will be no IJC support. In practice, members of the boards have only an indirect, and some suggest, a too modest role, in the priority setting process. They are less likely to seek resources from other sources, such as their home institutions or agencies, for Agreement-related activities that do not fall within IJC-funded priorities.[417]

One product of this process was the Priorities Report presented to the IJC at its 1995 biennial meeting in Duluth. Instead of separate reports as in the past, the reports of each advisory board were combined into a single document with a "priority summary" that addressed the issues marked for attention in 1993.[418] One issue raised by some SAB members was whether the boards have lost loss their profile and status within the IJC family in such a format.[419] The question still remained of what would become of issues that were of interest to a board but were not on the IJC's list of priorities.[420]

The Commission has determined its priorities three times since 1991.[421] While there seems to be support for the process, in 1995 some SAB members were attempting to confront the dilemma of how to carry out the activities of an entire work group that had not been allocated any funds.[422] The Commission has stated repeatedly that it is still attempting to refine the process.[423] It is interesting to note that the development of some priority-setting process was recommended by the NRC/RSC report in the mid-1980s.[424]

Another dilemma is that three different sets of priorities are set for advisory boards, for task forces established by the Commission, and for internal IJC activities. In the 1995--1997 biennial cycle, for instance, a number of internal IJC priorities were set that formerly would seem to be under the auspices of a board, namely, nuclear inventories and transition planning. But the roles of the boards themselves have also changed since 1991.

Water Quality Board. The 1991 Task Force Report provided three rationales for change in the mandate of the WQB from an evaluator of programs to a policy advisor. First, it noted (without explanation) that government personnel would no longer be generally available to participate in the substructures for the board.[425] There was no discussion about whether other alternatives to disbandment of the subcommittee structure were considered. Second, the reform was said to be needed to remove the perceived conflict of interest between the parties as "doers and reviewers."[426] The third explanation was that the change for the WQB was needed to better distinguish between the roles of the parties in implementing the Agreement and the role of the IJC in reviewing progress toward implementation.

Delegation of the traditional WQB role in development of water quality and ecosystem objectives and the planning of surveillance and monitoring programs back to the parties essentially created a vaccum for the WQB.[427] The 1989 report was the last report from the WQB in its former role of evaluator of progress to the Commission.[428] The first effort by the WQB in its new role as a policy advisor was a 1991 workshop in Toronto that resulted in a "vision statement" about "the future desirable characteristics of the Great Lakes" and suggestions to the Priorities Planning Group of the IJC.[429]

The 1991 and 1993 WQB reports were fundamentally different. The 1991 report, written by journalist and author Michael Keating, briefly discussed three general policy recommendations in only 47 pages.[430] The 1993 WQB report considered review of the

GLWQA, legislative and regulatory considerations for virtual elimination of toxic contaminants, and risk assessment, among other matters.[431] The 1995 WQB report provided more in-depth analysis of the topics it discussed, in particular pollution prevention and recent developments in the pulp and paper industry.[432]

Current and past members and other observers within the Great Lakes community point out that participation in the WQB has changed since the WQB now has no specific mission.[433] Other than the chairs or their representatives, high-level policymakers and agency managers seldom attend meetings. Some heads of state agencies say they find the WQB, the IJC, and even the Agreement irrelevant and some also expressed disappointment in the first SOLEC of the parties in 1994. By and large these comments were made by persons who were new to their present positions or who had no experience with the Agreement prior to the changes in process that followed the 1987 Protocol.[434]

Science Advisory Board. The SAB's mandate was neither changed in the 1987 Protocol nor the focus of reform efforts. The SAB's role is still to make recommendations on the resolution of current and anticipated problems that affect water quality. To this end, the SAB is to review scientific information, the adequacy of the research, and additional research needs and research programs for which binational cooperation is desirable.[435]

In the early 1990s, the SAB revised its structure to have three workgroups: Workgroup on Ecosystem Health; Workgroup on Emerging Issues; and Workgroup on Parties Implementation. The workgroups include both members of the SAB and outside experts whose work is relevant.

Several issues have persisted in the ongoing discussion about the mandate of the SAB from the adoption of the 1978 Agreement until the 1990s. First, from early on the SAB interpreted "science" broadly to include not only hard or basic and applied sciences but also work in other fields, including social sciences, ethics, law, and economics. Membership in the 1980s reflected the broader definition of "science" that followed adoption of the ecosystem approach to management as an aim in the 1978 Agreement. This trend accelerated under the leadership of co-chairs Jack Vallentyne and Alfred Beeton. By the mid-1980s, its four subcommittees were a Human Health Committee, an Ecological Committee, a Societal Committee, and a Technological Committee.

When the Council of Great Lakes Research Managers (CGLRM) was established in 1984, it assumed part of the role that had been assigned to the SAB earlier in the Agreement itself: the tracking of Great Lakes research. Nelson Thomas, U.S. co-chair of the council, says that the difference between the SAB and the CGLRM is that "the SAB interprets research while the CGLRM monitors research activities to make certain there is enough and appropriate research."[436] In 1992, the CGLRM was given full autonomous board status by the IJC, although such a body is not called for in the Agreement or its terms of reference for joint institutions. The council now reports directly to and obtains budgetary and work plan approval from the Commission.

A workshop on "The Role of the Science Advisory Board" in late 1991, as the IJC was considering institutional changes, was attended by four commissioners. The workshop provided a sounding board for the SAB members and raised a number of issues. Walter Lyon of Pennsylvania questioned whether the Planning and Priority Group process would allow the SAB to continue its former role as a "primary advisor" to the IJC when it would now have to compete for "the attention, the priorities, and the budget of the Commission."[437] After the 1989 biennial meeting, the Commission began to employ specialized task forces to address topics it determined. For some SAB members, these task forces confused the respective roles and responsibilities of the traditional board structures.[438]

The report also raised the issue of membership on the SAB again and led one disgruntled commentator to note in 1995 that "recent appointments of nonscientist policy advocates and advocates of specific interests are evidence of IJC preoccupation with attaining political balance in lieu of attention to science."[439] In reality, from the beginning

the SAB had members who were not scientists and represented various "specific interests," including industry and environmental advocacy.

Council of Great Lakes Research Managers. The stated reasons for creation of the Council of Great Lakes Research Managers (CGLRM) in 1984 were to enhance the ability of the Commission to provide leadership, guidance, support, and evaluation of Great Lakes research programs related to the GLWQA. In 1986, SAB Co-Chairs Vallentyne and Beeton assisted in creating new terms of reference for the council. The council must report to the Commission at least annually and its secretariat is located in the regional office.[440] Originally, the council reported to the IJC through the co-chairs of the SAB and articulated its concerns in a separate chapter in the SAB report.[441] It did, however, issue its own publications as well.[442]

After being given independent status, the council made its first separate report to the Commission in 1993 and also expanded the geographical area of interest and membership to include the St. Lawrence River.[443] The council now reports directly to and obtains budgetary and workplan approval from the Commission.

Members of the CGLRM are to be persons responsible for research programs related to the implementation of the GLWQA plus two SAB members appointed by the board. Other members of the CGLRM are appointed by the Commission upon nomination by the council. These members are to serve in their "personal and professional capacity and not as representatives of their employers or organizations," a charge that one commentator said laid the council open to the same charges of conflict of interest that had plagued the WQB.[444]

The council is said to have been established because of a view in the Commission that the SAB was "abstract and not dealing directly with science."[445] Former U.S. Chair Durnil said that the aim was to facilitate more effective use of research budgets and to direct research to the priorities determined by the IJC.[446] In effect, the existence of the council allows the SAB to continue its broad policy-oriented work without having to focus on such detailed work as inventorying research projects.

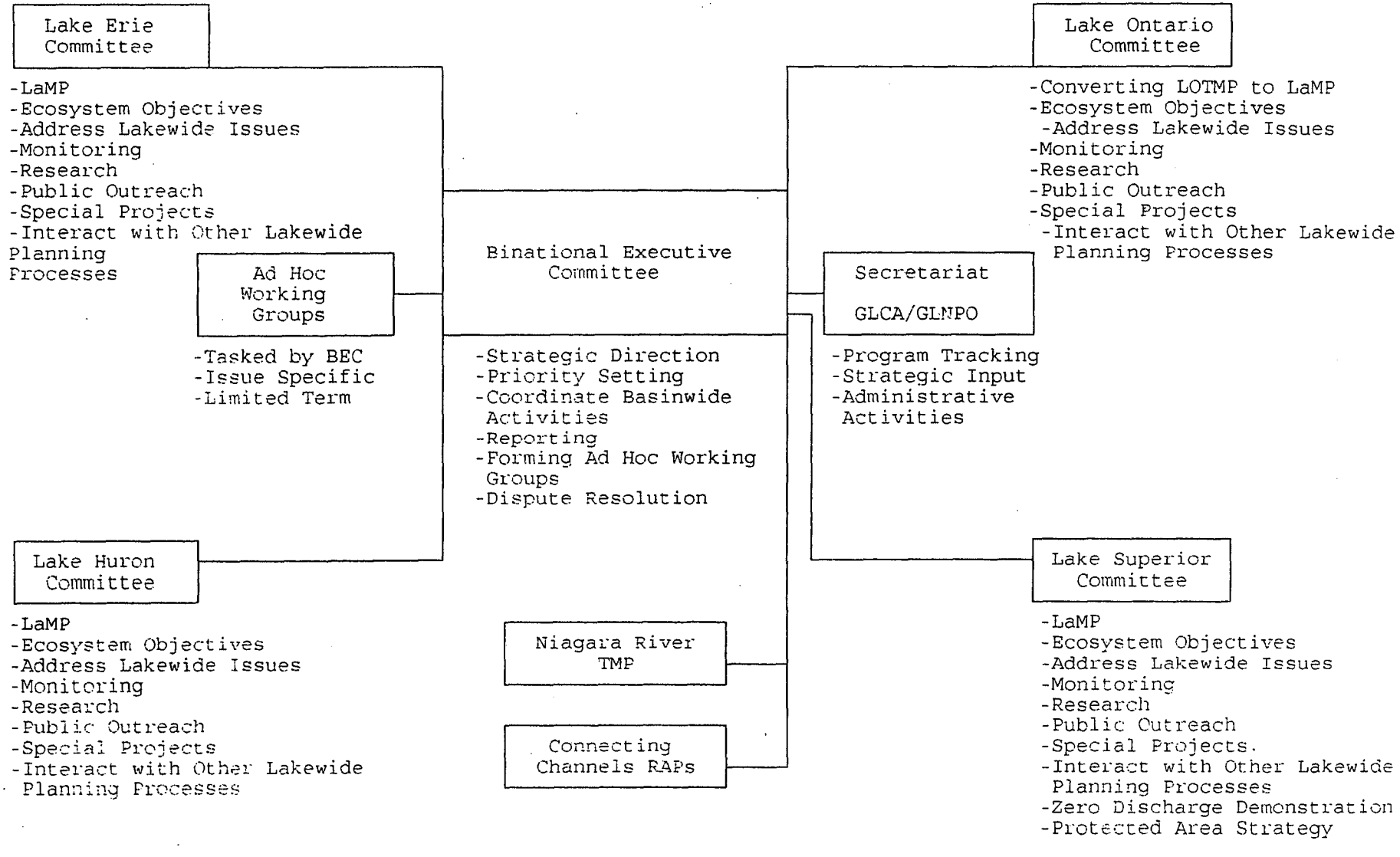
Other Advisory Mechanisms. In addition to the three boards, since 1990 the Commission has initiated several other advisory mechanisms not specified in the Agreement (see Table 8). Previously, special workshops or events had been sponsored by the WQB, SAB, or one of their subcommittees. Such events are now initiated by the Commission itself as it assumes a more direct managerial role of the Regional Office and the processes set up under the Agreement. One commissioner noted that, although the boards remain primary advisors, the Commission now can seek advice from a variety of sources.[447]

"Task forces" are time limited, narrowly focused on a single issue, and representative of a broad spectrum of opinion. Membership may be drawn from the boards and council or from outside "the IJC family." The subjects of several task forces to date include Virtual Elimination and the State of the Great Lakes Basin Ecosystem. The task forces operating in 1995 were on Lake Erie and Indicators for Evaluation. To date, the Virtual Elimination Task Force has been the most controversial.

The Virtual Elimination Task Force was constituted in July 1990 to "investigate the requirement of the amended Great Lakes Water Quality Agreement to virtually eliminate the input of persistent toxic substances into the Great Lakes Basin Ecosystem."[448] Confusion was created by the fact that, while it began as a joint body of the WQB and SAB, it was soon obviously a separate advisory mechanism reporting directly to the Commission.

A major difference from earlier special committees or work groups of the boards is that the Virtual Elimination Task Force was designed to provide consultation with multiple interests or stakeholders, with members representing federal, state, and provincial governments, industry, and environmental groups. Another difference is the increased participation of industry that resulted from reaction to the Commission's recommendations on chlorine (discussed below). In contrast to the consensus that had usually emerged from

TABLE 8
Binational Executive Committee and its Relationship to Binational Great Lakes Programs



Source: Adapted from Great Lakes Binational Executive Committee: Roles and Responsibilities - Draft Discussion Paper March 9, 1995-Binational Executive Committee Meeting-Fig. 1

events such as the Hiram workshop on an ecosystem approach to management, the final recommendations of the Virtual Elimination Task Force were the result of lengthy intensive negotiation among the scientists, environmentalists, and agency and industry representatives who made up the membership.[449]

The Commission accepted the task force recommendations on strategy in its Seventh Biennial report but it is unclear how they will be used. It is perhaps too early to evaluate their utility and the impact of the increased flexibility of the new approach.

"Roundtables" are another innovation for consultation by the IJC that is not called for in the Agreement. At the 1989 biennial meeting, the Commission announced an intention to undertake a number of "roundtables" concerning the GLWQA obligations for persistent toxic chemicals. This type of advisory vehicle demonstrated the desire of the commissioners who had recently taken office to have more direct contact with stakeholders.

The first "Zero Discharge Roundtable" was held in 1990 at Dartmouth College, New Hampshire. Participants included members of the Commission, advisory boards, IJC staff, and outside stakeholders. The next roundtable a few months later in Washington, D.C., concerned legislative issues pertaining to the goal of zero discharge.

The third of this set of roundtables may have been the most influential.[450] Held in Thunder Bay, Ontario, it focused on zero discharge in the pulp and paper industry. These roundtables occurred just prior to the 1991 biennial meeting in Traverse City and the subsequent Fifth Biennial Report from the IJC to the governments.

In 1993, another set of roundtables was begun under the joint sponsorship of the Physicians for Social Responsibility. Its purpose was to inform the health care profession about the health effects of toxic contaminants.

Great Lakes Regional Office. As described earlier, the role of the Great Lakes Regional Office was defined in the 1978 Agreement.[451] In addition to the government agency questions about the resources required to coordinate with the regional office in carrying out activities for the advisory boards, there had been earlier tensions between the IJC secretariat staffs and the regional office staff about who was in charge.[452] The changes in functions of the regional office since the 1987 Protocol have resulted from administrative decisions of the Commission following the report of the Reconstituted Task Force, not from Protocol language.

Two major changes were made. First, instead of managing board functions, regional office staff now are assigned as chairs, working members, or managers of the task forces that the Commission began to establish on such topics as virtual elimination.[453] Second, the regional office staff and the secretariat staffs in Ottawa and Washington are considered a single organization that serves as staff to the Commission.[454] With this change, the Commission itself became directly involved in day to day management of the regional office in new ways.

One controversial decision was the donation of the regional office library to the University of Windsor in 1992, coupled with a proposal to move the office to Detroit. The library held approximately 38,000 books and 300 periodicals, including the library of the former Great Lakes Basin Commission, which had been contributed to the IJC in order to make it available for public use.[455] The action provoked debate inside and outside the IJC, including a protest rally in downtown Windsor, and was clouded by an ongoing labor dispute between the library staff and the Commission.[456] For the environmental community, the library closing was a symbol of the reduction in the capacity of the regional office. To some scientists and academic experts, the closing of the library reduced accessibility to important Great Lakes documents and information assembled by the research community.[457] To the Commission, the savings in rent and personnel costs freed resources for programs.[458]

Part of the material is in a separate "Great Lakes Collection" at the university, while other material is merged into the general library collection. A staff member of the Great Lakes Institute at the university said that the parts of the collection are not being updated,

and students and others seeking Great Lakes information are referred to the IJC collection only for historical information.[459] Perhaps what is of most interest is that this matter caused such controversy.

The Biennial Meetings as an Institution

The GLWQA requires the IJC to report to the governments on progress in achieving the goals of the Agreement, annually until 1978 and biennially thereafter. From 1975, the IJC has held public meetings to receive the reports of the advisory boards prior to drafting its own recommendations to the governments.

From the beginning, the IJC meetings served as the most important gatherings for the ever-expanding community that was evolving around the Great Lakes regime. Attendance increased nearly every year and the formal agendas expanded as well as events associated with the meetings.[460] The most dramatic changes occurred following adoption of the 1987 Protocol, when the involvement of environmental leaders in the negotiation was followed by a decision to organize for greater participation in the 1989 meeting in Hamilton, Ontario.

The early meetings were mainly spectator events for environmentalists and other members of the public, although attendance provided an opportunity to interact with agency and IJC staffs, scientists, and others who were involved in activities of the boards, their subcommittees, and work groups.[461] Other diversions were provided at the 1983 meeting in Indianapolis but generally attendees not directly involved in presentation of the board reports were observers, with answers provided only for questions submitted in writing.

After 1989, the meetings became more interactive and participatory for a much larger and broader audience. Special presentations and comments by attendees came to overshadow submission of the board reports in an atmosphere that some called "a circus."[462] This issue is discussed more fully below in the section on "The Public and the GLWQA."

A new change occurred in 1995 when the biennial meeting in October was preceded by debate within the IJC over whether or not to have any formal presentation of the board reports at all. In effect, the pendulum had swung completely from the earliest meetings solely for the purpose of receiving the board reports to events providing a stage for stakeholders including industry, environmentalists, First Nations or tribal councils, and labor to lobby the IJC.

Another change was the combining of the reports of all three boards into one document for publication, with an introduction that summarized the priorities

determined by the Commission's priority-setting process. This one-volume report contrasted with an earlier practice of including reports from each committee or task force as appendices to the main report. The commissioners thought the condensed format would assist public understanding of the relation between the advice from the boards and the Commission's priorities. According to members, the issue for the SAB was whether the board could maintain a sense of distinctiveness and independence from other IJC institutions and whether distinguished scientists would continue to be attracted to participate.[463]

Parties Taking on Specified Responsibilities. The IJC acted on the recommendation of the Reconstituted Task Force that the role of the WQB should be changed from an evaluator of government progress under the Agreement to a policy advisor to the Commission. As articulated in May 1991, the concept was that the parties themselves, through Environment Canada and the USEPA, had agreed in the Protocol to provide the data needed to fulfill the following responsibilities:

1. Coordination of workplans;
2. Reporting of progress toward implementing the requirements of the Agreement;
3. Reporting on progress in completion of the RAPs;
4. Reporting on the state of the lakes, including conditions and trends;

5. Reporting on results of monitoring of enforcement actions compliance;
6. Use of Quality Assurance (QA) and Quality Control (QC) in monitoring;
7. Reporting on pollutant loads, and monitoring and reporting; and
8. Coordination of research.[464]

The mechanisms for how the parties would deliver this information and data are described below.

On-going Issues Resulting from the Changes. The evolution of significant changes in the implementation process under the Great Lakes Agreement in recent years is still continuing. Questions raised by the changes to date include:

1. Does the IJC have the institutional capacity to carry out independent assessment of the accuracy of the data submitted for assessment of programs and the state of the lakes?
2. Is the role of the IJC now to put forth its own views and the views of members of the public rather than to evaluate the significance of problems and the effectiveness of the governments in addressing them?
3. Does the IJC have any role in coordinating binational efforts to achieve the aims of the Agreement and what, if any, should the binational efforts be?
4. If the parties use the SOLEC process to assess the state of the lakes, who assesses the programs of the parties to determine if they are sufficient to meet the objectives of the Agreement?

The Commission recognized these challenges in part with the establishment in 1993 of the Indicators for Evaluation Task Force to assist in the development of a framework to evaluate the government information on the state of the lakes. As mentioned above, the report on indicators published in 1996 did not answer the question of how government programs are to be evaluated.[465]

The Public and the GLWQA

The expanded activities of environmental organizations in the regime and the success of the binational coalition that resulted from the formation of Great Lakes United during the 1980s was described in the previous section on the 1978 Agreement. During this time, environmental groups increased their activities inside and outside the Great Lakes region. Many publications assisted information exchange and other activities, including the Sierra Club's *Washington Report* (published until 1994), Great Lakes United's newsletter, and the membership publications of numerous other organizations. Many special reports published by nongovernmental organizations promoted binational activity across the border, such as Pollution Probe's mid-1980s map of *Toxic Hotspots,* and the *Prescription for Healthy Great Lakes,* produced jointly by the National Wildlife Federation and the Canada Institute for Environmental Law and Policy. *The Great Lakes, An Environmental Atlas and Resource Book,* originally produced by USEPA and Environment Canada in 1986, has become such a standard sourcebook for Great Lakes information that two updated editions have been published since.

Several series of fact sheets have also been widely distributed within and beyond the community directly involved with Agreement processes, including information about each of the lakes by the Great Lakes Basin Commission and the University of Michigan Sea Grant program. In the early 1990s, the Center for the Great Lakes issued fact sheets for each of the 43 Areas of Concern where RAPs are being developed. Through the years, Agreement issues have also been addressed in the research supported by the Sea Grant Programs at public universities in all eight Great Lakes states.

Apart from the information networks and contacts, the period from 1987 to 1993 in the Great Lakes regime was marked by the expansion of the role of nongovernmental participants in the biennial meetings of the IJC and by a dramatic change in how the IJC responded. The new era of participation in biennial meetings was launched in 1989 at

Hamilton, Ontario, as a continuation of efforts to force more action on toxic contamination by the governments.

The 1989 Meeting in Hamilton. As described earlier, public concern had been growing through the 1980s in both countries, especially in the Great Lakes basin, about hazardous materials and the lack of controls that allowed the release of toxic contaminants into the environment. In this region, through contacts within the community that had formed around the Great Lakes Agreement, environmentalists were assisted by scientists in dramatizing the effects of contaminants on wildlife in Congressional hearings.[466] Established environmental groups also formed alliances with the new "grass roots" groups that had formed following Love Canal to protest siting of waste facilities.[467]

The decision of a working coalition of environmental groups to increase the public's presence at the 1989 meeting was the result of frustration about the limited public role in earlier meetings and a followup to the basin-wide hearings organized by GLU in preparation for the 1987 review of the Agreement. Planning began more than a year in advance, for the first time with the participation of Greenpeace, which had recently instituted a new Great Lakes program of its own. The international advocacy organization provided funding to augment the resources of the Sierra Club, the Lake Michigan Federation, Canadian Institute for Environmental Law and Policy, the National Wildlife Federation, and Great Lakes United.

Another possible factor may have been the negotiations with IJC staff over whether a separate meeting of environmentalists would be held. A senior IJC staff member has stated that "in the late 1980s senior IJC staff decided that the parties were not doing enough to control toxic contaminants and considered how to increase attention of the IJC to this issue."[468] David LaRoche, head of the U.S. secretariat, had taken part in the Mackinac Island meeting where GLU was launched and was well in tune with the environmental network. The format of the 1989 meeting was determined after consultation between the Commission and an environmental planning group.

Originally, the environmentalists intended to hold a parallel meeting at an adjacent site at the same time as the official meeting. The Commission offered a counter proposal to provide opportunity for direct public participation in the meeting. It was agreed that time would be allowed in the agenda for three types of presentations that included presentations by local environmental groups; a coordinated presentation organized by the environmental planning group; and (3) statements during time set aside for any attendee to address the Commission. In addition, the IJC would cooperate in making arrangements for a host of activities outside the formal meeting sessions, including briefing sessions for other attendees, press conferences, and tours to local sites of interest.

Five organizational meetings were held across the basin. For several months in advance, the planners, assisted by groups in the Hamilton area, worked to organize events and attract new participants to the meeting. Great Lakes United and its member organizations widely distributed its report critiquing toxic control programs.[469] Greenpeace toured the Great Lakes in its boat, the *Moby Dick*, urging attendance at the IJC meeting.

The cooperating environmental organizations encouraged their members to attend through newsletters and mailings about housing and the availability of charter buses subsidized by Greenpeace from several locations. Results exceeded expectations. For instance, a bus arranged by the Lake Michigan Federation started in Milwaukee and picked up passengers in Chicago and Northwestern Indiana before proceeding across Michigan to Hamilton. Most of the riders, including students from the University of Wisconsin in Madison, had never before attended an IJC meeting and learned about the Agreement in a rolling "workshop." The roundtrip fare was about $25.[470] Other buses came from throughout the Great Lakes basin. Help was also provided in arranging car pools.

Nearly a thousand persons attended the meeting, about twice as many as had attended any previous IJC meeting. By contrast with the usual polite and quiet IJC affairs, this meeting was noisy, in part because of the crowd and in part because of the nature of the

presentations by the environmental organizations and dozens of individual citizens of both countries. Well-orchestrated presentations were made by Great Lakes United, Greenpeace, the Canadian Institute for Environmental Law and Policy, the Canadian Environmental Law Association, and others. Signs and songs added theater to substantive statements on issues presented with intense emotion. At times the noise level made it seem like a sporting event as the audience responded to presentations.

Following the group presentations, dozens of individuals spoke, often with deep feeling, during nineteen hours of citizen testimony over two days. Many statements demanded that the governments and the IJC act to eliminate toxic contamination from the Great Lakes. Both IJC commissioners and official board members who were present remember the long hours of listening as an ordeal.[471] They were also surprised at the cohesion of the message delivered by persons of all ages and many different backgrounds from throughout the basin. Some statements were so pointed and bitter in commenting on the perceived lack of effectiveness and motives of the WQB that the U.S. chair still felt years later that his personal integrity had been attacked.[472]

Another major surprise was the keynote speech at a luncheon sponsored by the IJC. USEPA administrator William Reilly had originally been scheduled to speak in the tradition of featuring a politician or senior official on such occasions. When Reilly canceled a few days before the meeting, Joyce MacLean, director of the Greenpeace Great Lakes office in Toronto, agreed to take his place.[473] Her speech was supplemented by a theatrical demonstration with costumes and music intended to arouse emotion. Whether one agreed with the message or not, it was a show like no other seen at a biennial meeting to that time or since.[474]

The environmentalists considered the whole affair a major triumph in opening up the formal meetings of the IJC to public participation and it is remembered as a defining event throughout the Great Lakes community.[475] Views vary about whether its results were positive or negative, but there is agreement that it resulted in changes in how biennial meetings have been conducted since and in the way subsequent IJC reports to the governments were produced.[476] Less certain is whether the decreased participation of the parties in subsequent meetings is due to the changes that followed the 1987 Protocol, to disapproval of the new format by government officials, or to the personal styles and views of individuals, including members of the IJC, who make the relevant decisions.

The 1991 Meeting in Traverse City. The 1991 Biennial Meeting in Traverse City, Michigan, followed essentially the same format as the 1989 meeting in Hamilton but with a more complex agenda. A total of 1,600 persons registered at the meeting in spite of the rather inaccessible location, and the enthusiasm of the nongovernmental participants was again high. Release of various reports by environmental groups was timed to provoke media focus on the Great Lakes and the meeting.[477] For the first time, a significant number of industry representatives were also present.

This was the first IJC meeting for the Great Lakes Agreement where presentation of the traditional WQB report on the State of the Lakes was not a major agenda item. The board report, written by a journalist, outlined a number of general issues pertaining to toxics with some broad recommendations.

In Traverse City, the parties held their own conference on pollution prevention that in some respects overlapped with the IJC meeting. In cooperation with the Center for the Great Lakes, the Council of Great Lakes Industries also sponsored a session on pollution prevention. With other concurrent events including a major workshop on health effects of toxic substances, attendees noted that it was difficult to know which event belonged to which meeting.[478]

The meeting was the best attended to date by high-level government officials from both sides. Both Canadian Minister of the Environment Jean Charest and EPA Administrator William Reilly appeared. Charest announced that his government would sponsor a consultation to examine how to phase out persistent toxic chemicals.[479] Ontario

Minister of the Environment Ruth Grier also attended and committed her ministry to pollution prevention and a process to identify toxic substances to be banned and phased out in general use. There was resentment by government officials about the Greenpeace banner hung outside the hotel but many of the citizen activities this time took place away from the official meeting place.

The 1993 Meeting in Windsor. The 1993 biennial meeting in Windsor, Ontario, ranked close to the meeting in Hamilton in terms of the intensity of activity. About 2,000 persons attended at least part of the meeting, including 300 representatives of industrial interests and 500 members of environmental organizations. The main event was an intense debate between spokespersons for Greenpeace and the Chlorine Chemistry Council, which had been established to oppose attempts to ban the use of chlorine in industry. The theater at this meeting was scheduled with performances by the Trinity Theater of Toronto plus various demonstrations by members of the audience such as the wearing of papier-mâché animal heads.

The WQB report reflected its new mandate to provide policy advice rather than reporting on the status of programs. In response to the absence of the traditional review of programs that had characterized earlier WQB reports, two dozen citizen groups endorsed a report that evaluated government performance on toxic contaminants and gave both sides a "D" grade.[480]

Many attendees now considered this meeting "typical." Others, especially the staffs of government agencies, again characterized it as a "circus." The differences in impressions seem to have influenced the organization of the 1995 meeting in Duluth, Minnesota.

The 1995 Meeting in Duluth. The Duluth meeting was the first official meeting for all six newly appointed IJC commissioners. The distant location may account for the smaller attendance by representatives of both industry and environmental groups, although 1,900 persons registered.

The IJC is said to have made a concerted effort to structure the agenda in ways that would change the tone.[481] Another factor may have been a decrease in advance organization by the large environmental groups. Nevertheless, a number of environmental groups made a well-organized joint presentation on current significant issues for the Great Lakes, and local organizations arranged special activities for visitors.[482] Many government officials attended in order to sign the Lake Superior Binational Agreement, which had been in development for several years.

The Changing Biennial Meeting Format. Following the 1995 meeting, the Commission embarked on a process to examine the format and content of the biennial meetings. The meeting evaluations, a mail-out survey and a number of selected interviews, convinced the Commission that the biennial meeting should be redesigned. From the responses collected, the IJC decided that efforts should be focused on attaining positive news media coverage and a format that was more informal, less staged and more interactive.[483]

Moreover, the Commission felt that the format of the earlier meetings did not provide the full range of information and views needed to write the biennial report.[484] To assist in the revision of the format, the IJC contracted for consultation by a public information firm assist in changing the biennial meeting.

The new format was disclosed in Septmber 1996. According to the Commission, the revised format would extend the IJC's previous approaches to public involvement from education and information feedback to include consultation and to a limited extent, joint planning.[485] To accomplish this, the new consultation proposal consisted of a range of mechanisms, including:

1. The development of "sector papers" by IJC invitation to key sector leaders;
2. Commission visits to sites where information could be obtained about RAPs and LAMPs at community and lakewide levels;

3. Two roundtables, each with the commissioners and approximately 12 sector group representatives, to consider a vision of the agreement work for the next 25 years;
4. Focus group interviews with selected sectors that have not been active in previous consultation processes, such as funding organizations, First Nations/Native Americans, and communities-at-risk [from toxic contamination];
5. Annual public meetings for the advisory boards to assist in the integration of the boards into the consultation process and secure input at community and regional levels;
6. Thirteen workshops and conferences by the boards and council to further integrate the boards into the IJC's consultation process and ensure broader understanding of current priorities;
7. IJC public meetings to provide an opportunity for the public to interact with the commissioners prior to the IJC formulating recommendations; and
8. A Great Lakes Summit to discuss findings from sector papers and other consultation sessions at a visible basinwide event.

The overall thrust of the proposal was to eliminate the biennial meeting and replace it with a series of other venues for consultation. The "Great Lakes Summit" was seen as a one-day public event and was not considered to be a "scaled down" biennial meeting. Another implication is that the practice of having, in public, formal board presentations and presentations by governmental agencies themselves was also eliminated.

At a meeting set up by the Commission to discuss this proposal, some industry representatives supported the elimination of the biennial meeting and replacement with the new proposed process. Their primary concern was that in their view the format of the 1989–1995 meetings did not allow adequate presentation of the "facts" needed for the IJC biennial report.[486]

Once news of the demise of the biennial meeting had been rumored in the early summer, environmental groups almost immediately criticized the decision.[487] During the September consultation meeting on the proposal, groups argued that the biennial meeting served has an useful organizing tool and made all members of the community more accountable by having to face the public and other stakeholders. Although the groups supported the proposed new consultation mechanisms, they said that they should be in addition to, and not instead of, the biennial meetings.[488] The IJC responded that available funding was insufficient to support both a biennial meeting and all the other components of the process. In October, 1996, the IJC decided to reinstitute the biennial meeting. As of press time, its format had yet to be decided.

Changes in the Biennial Reports and Policy Developments

The style and substance of the reports submitted to the governments by the IJC following the 1989 meeting also differed from the earlier pattern. Earlier reports had relied principally on the board reports and the IJC's analysis and required that the reaader have knowledge of the context of the ongoing implementation process for the Great Lakes Agreement for full understanding.

The Fifth Biennial Report that followed the 1989 meeting was more comprehensible outside of the Great Lakes community but also did not rely as wholly on the advisory board reports. Part I outlined the public's concern as articulated at the meeting. Part II responded to those concerns by urging that the governments set timetables for achieving the zero discharge of toxic contaminants that had been demanded so forcefully at Hamilton.

The Sixth Biennial Report to the Parties that followed the 1991 meeting became the most controversial, mainly because of its recommendation that the governments develop timetables to "sunset," that is, discontinue the use of chlorine and chlorine-containing compounds in industrial feedstocks. The Seventh Biennial Report that followed the 1993 meeting supplemented the endorsement of the earlier recommendations and suggested that

the governments report on progress in eliminating toxic contaminants with a biennial State of the Lakes Ecosystem report starting in 1995. For the first time, this report also included recommendations to the business community, labor and the news media that they join in seeking virtual elimination of persistent, bioaccumulative toxic substances.

The Eighth Biennial report followed a format similar to the previous three reports. The focus of attention in the report was on the deregulation trend in both countries and its possible impacts on Great Lakes laws, policies and programs. Apart from the discussion of deregulation, there were no major policy shifts or priorities.

One of the major trends in Phase 3 of the evolution of the Agreement is the impact of the policy innovations in environmental management in the recommendations of the IJC in its biennial reports. Some of these recommendations include: the need for a reverse onus, the furtherance of a weight of evidence approach, the use of "sunsetting" as a means to the virtual elimination of toxic contaminants, and--in the most controversial recommendation--the call to eliminate chlorine as a feedstock. These recommendations not only contribute to public policy debate but also reveal dynamic interaction within the regime.

Reverse Onus and Weight of Evidence Approach. The 1989 biennial report of the IJC focused on the goal of zero discharge as defined under the Agreement. The principle of reverse onus was among recommendations aimed at preventing the further releases of persistent toxic substances into the environment. As stated by the Commission, "when approval is sought for the manufacture, use or discharge of any substance which will or may enter the environment, the applicant must prove, as a general rule, that the substance is not harmful to the environment or human health."[489] The 1996 Eighth Biennial Report reiterated the call for a reverse onus approach.

Although there had been general discussion of the idea in previous reports of the "weight of evidence" approach, the Sixth Biennial Report in 1992 recommended application of the approach to identify and virtually eliminate persistent toxic substances. This approach attempts to deal with the problem of how to make legislative and policy decisions in the face of scientific uncertainty. The Seventh Biennial Report in 1994 restated the recommendation and suggested that the definition of the principle should be pragmatic.

The 1996 report noted that the weight of evidence appoach should be used to trigger reverse onus procedures rather than leaving the burden of proof to environmental management agencies with limited resources. Both approaches, the report said, will further the prevention, or precautionary approach, that is necessary if society is to escape the burden of management after the fact of the damage caused of substances that turn out to be too dangerous to use. "Governments must lead this process of transition," said the report, by "a carefully planned and deliberate process of transition away from the persistent toxic substances we now produce and use to more environmentally and humanly sustainable pattern of production and consumption."[490]

Sunsetting Approach. Also following on earlier discussion, the IJC Seventh Biennial Report urged the "sunset chemical" approach as the policy to implement the zero discharge approach for the worst substances. With this approach, identified substances would be restricted, phased out or even banned from manufacture, use, transport, and release. The concept is not new; a variety of substances have already been banned on an ad hoc basis as evidence of their danger was developed. The difference in this context is that a systematic approach is proposed with use of substances discontinued when certain criteria are met.[491]

The IJC also extended this concept beyond individual substances to classes or families of substances, even to industrial feedstocks. Application of these concepts to chlorine created controversy within and outside of the IJC.

Recommendation on Chlorine as a Feedstock. The most dramatic issue during the most recent period of the Agreement resulted from the recommendation in the 1992 Sixth Biennial report that the parties "develop timetables to sunset the use of chlorine and

chlorine-containing compounds as industrial feedstocks and that the means of reducing or eliminating other uses be examined." The reverse onus, weight-of-evidence and sunset chemical concepts challenged existing policy frameworks; the chlorine recommendation challenged a large sector of contemporary industry that includes drug, paper, pesticides, and plastic manufacturing. It also concerns the substance used most widely to prevent bacterial disease in drinking water and for other sanitary purposes. Detailed discussion of the IJC's action on chlorine can be found in an in-depth 1995 law review article and in a book by Gordon Durnil, who was U.S. co-chair of the IJC when the recommendation was made.[492]

There were several consequences of the chlorine recommendation for the Great Lakes regime. First, the action galvanized industry to lobby against the recommendation inside and outside the IJC. From 1992, industry, and particularly through the Chlorine Institute, began to take notice of the work of the Commission and to devote considerable financial resources (reportedly over $10 million per year) and effort to seek to discredit the recommendation. About 300 representatives of industry attended the 1993 biennial meeting in Windsor to support the industry position in the nearly day-long debate between representatives of Greenpeace and the Chlorine Institute.

Second, active debate continues about the scientific justification and legitimacy for the recommendation. While the problems caused by some chlorine compounds are recognized, industry rejects the proposal to phase out the use of chlorine as an industrial feedstock. The scientific community also is divided on whether the whole family of chlorine compounds should be phased out.[493] Finally, operators of drinking water supply agencies argue that more lives would be lost than saved if chlorine could no longer be used for disinfection. In recognizing the controversy, the IJC explicitly applied the weight-of-evidence approach where science remains uncertain and resolved to deal with chlorinated substances as a class as opposed to a substance-by-substance approach.

Third, questions have been raised about the process by which the recommendation was developed. The IJC now considered the information and views provided in the task forces and roundtables as well as the public hearing sessions of the biennial meetings in developing its biennial reports to the governments.[494] A related issue is whether the IJC provided enough justification for the recommendation.

Some observers believe that the new advocacy role of the Commission has undermined its reputation for making objective judgments based on expert advice derived from joint factfinding. Others vigorously defend both the substance of the recommendation and the process that developed it.[495] The ability to hear evidence from a variety of means, including roundtables and task forces, has allowed the Commission to deal with this controversial issue in a bold and aggressive manner that was not possible under the traditional structure.

Further, the IJC has pointed to a clear string of recommendations from the SAB calling for the phasing out of persistent toxic substances, and in particular, halogenated organics.[496] The interim report of the Virtual Elimination Task Force made a similar proposal.[497] An in-depth review of the decision-making processes following the 1991 biennial meeting, which included interviews with the Commissioners, concluded the following: "Taken together, these comments suggest that in at least some cases, the commissioners pursued an issue on the basis of public testimony, sought the support of their scientific advisory boards before committing themselves, and then having received such support, genuinely perceived subsequent comment on this issue from the public as simply confirming their scientifically based beliefs."[498]

Finally, the IJC recommendation gave the IJC a new high profile.[499] Whether this was a positive or negative result depends, of course, on one's perspective. Many environmentalists praise the Commission for a bold, comprehensive approach that gave IJC the attention it both needed and deserved. Others have expressed concern that this boldness has adversely affected the credibility of the Commission.

While the chlorine recommendation remains an important issue in the work of the IJC, it is apparent now that the chlorine debate is larger than the IJC and the Great Lakes, as the use of chlorine continues to be debated in Europe, North America, and elsewhere. In the two biennial reports following the chlorine recommendation, the IJC has reconfirmed its resolve for the recommendation, including after the membership of the Commission was replaced. Further, the Commission is considering next steps in the chlorine issues. The environmental and labor communities are pressing for attention to planning for a transition to cleaner, non-chlorine based industry.[500]

Evolution in the Role of The Parties

Since the 1987 Protocol, the role of the parties in the Great Lakes regime has changed in informal and formal ways. The lead agencies have sought to respond to the charges of a conflict of interest for agency officials who served on the WQB while also deciding how to participate in the IJC process in the light of fiscal and budgetary constraints and IJC criticisms of the parties. For all three reasons, the intent of the 1987 Protocol was interpreted to be that the parties should formally assume functions that had previously been within the domain of the WQB.

Before the Protocol, Environment Canada and USEPA provided information on progress, for example, the number of municipal systems that had or had not achieved the level of treatment required by the Agreement, to the WQB. Results of the monitoring of water quality and other conditions in the lakes were gathered by the WQB's surveillance committee and the IJC used information about progress in meeting the Agreement's specific objectives provided by the WQB in preparing its biennial reports to the governments. After the 1987 Protocol was adopted, these and the other functions listed above were undertaken by the lead agencies.

One of the primary differences between the former and newer roles of USEPA and Environment Canada that the agencies now report directly to the IJC rather than through the WQB. The two sides report separately for some functions, such as their national programs, but together on others, such as their joint assessment of the state of the lakes.[501] As discussed above, this new reporting process raises questions about the capacity of the IJC to evaluate or respond to the reports. New confusion is illustrated by the decision at the May 1994 BEC meeting to provide separate responses to some of the IJC recommendations in its Seventh Biennial report and joint responses to others.[502]

The new bilateral structure has evolved over several years since the signing of the 1987 Protocol. Initially, USEPA and Environment Canada personnel as well as representatives of other federal agencies on both sides met twice a year for a total of eight meetings over four years.[503] Ontario and Quebec officials also attended.

At the end of 1991, a "Parties Framework" was established that included a Binational Executive Committee (BEC) that would meet twice a year to resolve policy issues and determine priorities in meeting the requirements under the Agreement.[504] The BEC would be co-chaired by the Ontario Regional Director General, Department of Environment, and the Region 5 USEPA Administrator. Canadian membership was to include the directors of the federal Great Lakes Environmental Office (GLEO) and the Water Resource Branch of the Ministry of the Environment and representatives of several other agencies. U.S. membership was to include the director of GLNPO, two state representatives, and officials from several additional federal departments. GLEO and GLNPO would act as secretariat.

A Binational Operations Committee (BOC) was also formed to oversee coordination of the binational planning and program priorities identified by the BEC. The BOC could establish small task forces and forward information, progress reports, and plans to the BEC for review and approval. It usually met quarterly. In effect, the BEC is for policy level officials, while the BOC was for mid-level managers with operational responsibilities within their agencies. Table 9 provides a chart of this management framework.

Table 9: Status of RAP development

Percent of RAP Stage Completed	Problem Definition (Stage 1)	Planning (Stage 2)	Implementation (Stage 2)	Use Restoration (Stage 3)
100%	71(32)	16(7)	2(1)	2(1)
50%<100%	12(12)	62(28)	29(13)	7(3)
<50%	2(1)	22(10)	69(31)	91(41)

Source: Neely Law with the assistance of John Jackson, A Report on the Remedial Action Plan Process in the Great Lakes, Background paper was prepared for the Institute on International Environmental Governance, Dartmouth College, (1996), p. 4.

Problems in the initial bilateral structure led to the elimination of the BOC in March 1995.[505] A discussion paper outlined how the BEC would maintain its role, with provision for associate membership of additional federal agencies on both side of the border.[506] The BEC operates by consensus and continues to meet at least twice a year. The secretariat provided by the two special Great Lakes agencies provides strategic input to BEC and assists in the coordination and tracking of the binational program activities and provisions of the Great Lakes Water Quality Agreement.

Another innovation of the current structure calls for the establishment of a Lake Committee for each of the Great Lakes. Membership is comprised of Canadian and U.S. environmental and natural resource management agencies having jurisdiction in the respective lakes. Membership on the Lake Michigan Committee is derived exclusively from U.S. agencies with provision for a Canadian agency observer.

For a time, the relationship between the parties appeared to be complicated by controversy about the outspoken views of the director of the USEPA's GLNPO office about what he considered to be the inadequacies of the Canadian approach to pollution control.[507] Twice the Canadian government lodged diplomatic protests regarding his public statements urging Canada to adopt the U.S. regulatory approach.[508] When interviewed for this project in 1992, he also echoed the criticism by others that participation in IJC boards and committees required too much time for agency personnel to attend meetings and prepare reports. In 1995, he took another position in USEPA that does not relate to the Great Lakes.

Lake Committees are to oversee development of the Lakewide Management Plans (LAMPs) called for in the 1987 Protocol. In addition, the BEC may establish ad hoc bilateral working groups outside the IJC structure for basin-wide issues. Working group activities to date include the State of the Lakes Ecosystem Conference, development and revision of the specific objectives under Annex 1 of the GLWQA, and implementation of an Integrated Atmospheric Deposition Network (IADN). Working groups will also develop binational responses to IJC biennial reports and develop a binational toxic substances management strategy. The BEC and its relationship to other Great Lakes programs is shown in Table 8.

In late 1994 and early 1995, work began on the binational strategy on toxic substances that the IJC had called for in every biennial report since the 1978 Agreement.[509] A draft strategy was presented to the IJC at the Duluth meeting. Although environmental groups were not entirely satisfied, they applauded features such as deadlines for specific reductions of certain substances and periodic reporting requirements.[510] The final strategy was is to be completed in late 1996 or early 1997.

The 1994 SOLEC was held by Environment Canada and USEPA to provide information on the physical, chemical, and biological integrity of the Great Lakes system to assist in setting program priorities. Intended to set the pattern for followup conferences in alternate years, SOLEC was designed to complement IJC biennial meetings. The organizers said that it was not to be "political" but rather to make scientific information available to 400 managers and decision makers.[511] Industry and GLU representatives were invited to participate with scientists and agency representatives in planning the agenda. Six background papers on aquatic community health, human health, habitat, contaminants, nutrients, and the economy were commissioned. Approximately 350 persons attended.

A summary of the six background papers was presented at Duluth as the first State of the Great Lakes Ecosystem report, called for by the IJC from the parties.[512] The report makes it clear that does not address the status of the programs created to deal with stresses to the ecosystem. Program information was to be provided in a different series of reports prepared separately by the lead agencies for the governments.

The second SOLEC meeting was held in November 1996 in Windsor. This time the focus was on nearshore waters and how land use affects water quality. Attendance nearly doubled from 1994, with almost 600 persons registered., The majority were agency officials at all levels, plus a number of environmentalists and representatives of industry as

well as staff of research agencies. The five sitting IJC commissioners and staff of the regional office also attended SOLEC events in addition to meeting separately. Again, the background papers described conditions and problems more fully than the adequacy of programs designed to address them.[513]

As mentioned above, the IJC created an Evaluation Task Force in May 1995 to establish a framework to review data submitted by the parties, such as the SOLEC reports.[514] The task force submitted a final report in April 1996.[515]

Review of Programs. Prior to the 1991 change in mandate, the WQB assessed the adequacy of the parties' programs to meet GLWQA goals. It is not clear how such assessment is to be made since it is no longer done by the WQB. To date, the Parties Assessment Workgroup has not provided such analysis and is unlikely to do so with the information and limited resources available to it. At this moment, programmatic assessment seems to be a weak link in the evaluative role of the IJC.[516]

Although the IJC can still comment on the parties' programs, in the new relationship the binational advisory boards will not provide data and information for this purpose. Experience in the BEC to date suggests that the agencies are unlikely to engage in self-evaluation, since observers report a shift from a "mutual search for solutions" frame of mind that formerly existed in the WQB to that of "negotiation on the common position to be presented to the IJC in the BEC."[517]

The decrease in the exchange of information about programs, either between the parties or between the parties and the IJC, is occurring at a time of major change in government function. The major question in Canada is whether priority will be given to Great Lakes programs because of obligations under the Agreement ii use of reduced fiscal resources. In the U.S. during this phase of the Agreement, the Region 5 office of USEPA has carried out major new initiatives in restructuring its policies to follow the ecosystem approach instituted by Reilly and continued under Carol Browner, the administrator appointed by President Clinton.

One example is the "geographic initiatives" that began in 1990 as a concentration of enforcement effort to obtain compliance with all federal environmental laws in specific areas of environmental degradation. The first area designated for priority cleanup effort was Northwest Indiana, followed by Southeast Michigan and Northeast Ohio, all in the Great Lakes basin. The Indiana effort has evolved into a strong state/federal partnership in a Northwest Indiana Action Plan.[518] Results to date include court-ordered consent decrees under which major industries commit very large sums to the cleanup of contamination from past activities and prevention of future pollution.

In a spring 1996 settlement, the USX steel company at Gary agreed to pay a total of $196 million dollars. Of the total, $90 million will be spent to bring the company's huge Gary works into compliance with environmental regulations, $100 million for voluntary measures to go beyond what is legally required and even the $6 million paid to the state as a fine to clean up the Gary municipal landfill. Now the initiatives have evolved to include support for community efforts on sustainable development.

Meanwhile, the Great Lakes National Program Office (GLNPO) also initiated an Ecological Protection and Restoration Program that provides grants for research and demonstration projects for the restoration of habitat and the preservation of biodiversity. The rationale for the program includes U.S. obligations under the Agreement as well as U.S. federal environmental laws. It is managed by a team that includes personnel from the agency's regional offices in New York City and Philadelphia as well as Chicago. An April 1996 report said that from 1992 to 1995, a total of $8,519,219 in grants was made to 36 local, tribal, state and federal agencies and nongovernmental organizations. An additional $9 million from other sources was also spent on 87 projects.[519]

Development of the Great Lakes Water Quality Initiative, discussed above, is another major USEPA project in this period. The process by which states would comply with the federal requirements was underway through 1996.

Role of Provinces. The 1987 Protocol did not prescribe changes in the role of the states and provinces. Interesting developments in this phase include the new COA in Canada and state and province responsibility for RAPs. Section 3.1 related how the the COA evolved from its first stage in the 1970s as a money transfer agreement between Environment Canada and Ontario to a second expanded version in the 1980s.[520]

The 1985 COA was to have expired on March 31, 1991, but was extended for two years when the federal and provincial governments were not able to conclude a new agreement. A new agreement was signed in 1994. The delay demonstrates the complexity of federal/provincial relations for Agreement purposes.[521] The federal government refused to pay the additional costs of upgrading sewage treatment plants in fulfillment of the Great Lakes Agreement obligations on the grounds that such costs should be completely recovered through fees on water and sewage treatment plant users.[522]

The second controversial issue echoed the chronic complaint of the U.S. states, namely that the province has to pay the costs of commitments negotiated by the federal government.[523] It was reported that Ontario either wanted more control in the making of Great Lakes commitments or greater federal involvement in paying for specific environmental programs.[524]

Another issue was that the province wanted RAPs to have priority, while the federal government wanted priority for LAMPs, especially because of indications that the U.S. wanted to move ahead with LAMPs.[525] The 1994 COA differs from its predecessors in having an ecosystem perspective and measurable targets for achieving basic objectives.[526] Another difference is that both levels of government share responsibility for achieving Great Lakes objectives.[527] Finally, unlike the previous COAs, the 1994 version did not specify the federal share of costs.[528] In 1996, with severe cutbacks in both federal and provincial budgets, there is concern as to whether these commitments are still realistic.

Although Quebec is not covered geographically and has preferred not to be bound by the GLWQA, it has had a role in the development of the regime. Meanwhile, from the late 1980s, the federal and Quebec governments have entered into agreements with concepts derived from the COA and the Agreement.

A 1988 St. Lawrence Action Plan committed to a 90 percent reduction in toxic effluents discharged from 50 priority industrial plants by 1993, as well as the restoration of contaminated sites and wetlands, creation of a marine park, and recovery of certain threatened species including the beluga whale. The plan received $110 million from the federal government and $65 million from the Quebec government. It was replaced in 1993 by a Quebec program that includes the commitment "to restore degraded sites in the Lawrence ecosystem through 23 Zones of Priority Intervention (ZIPs)," which are similar in function to RAPs for areas of concern.[529]

Role of States. In 1995 and 1996, the continuing ambivalence of the states in the U.S. about Agreement-related programs could be seen in the withdrawal of state support for development of the RAPs. Earlier, the states had mainly passed through federal funds received from USEPA with a proportion of state matching funding. After USEPA announced that it would no longer provide funds to the states for RAPs, Michigan took the lead in announcing in late 1994 that it would discontinue state support over the following three years. Then Wisconsin withdrew from three of its five RAPs and Minnesota from its single RAP. Current trends with RAPs are discussed below in more detail.

State support for the Great Lakes Water Quality Initiative has changed with changes in political affiliation of the governors. In general, the seven Republican governors who took office in the 1990s have been more responsive to industry and local government opposition than their Democratic counterparts. Although all the state environmental agencies had agreed to the version of the GLI that was forwarded to the USEPA in an earlier stage of the regulatory process, only the Democratic governor of Indiana approved of the final version that the agency promulgated in 1995.

RAPS, LAMPS and the Lake Superior Binational Forum

Three unique institutions called for in the 1987 Protocol require federal plus state or provincial participation, or both, and depend substantially on the involvement of representatives of the public as well as local governments and other interests. All three processes have been underway during the third phase of the Agreement but their final outcomes are uncertain.

Remedial Action Plans. Remedial Action Plans (RAPs) are locally developed plans for remediation in areas where the objectives of the Agreement have not been achieved, called Areas of Concern (AOC). Based on efforts to develop a local cleanup plan for the Grand Calumet River in Northwest Indiana, the concept was recommended by the WQB to the IJC in 1985 and made part of the Agreement in Annex 2 with the 1987 Protocol.[530] The intent is for governments, industry, and local residents, known as stakeholders, to participate in development of a remediation plan.

Initially, forty-two, and later forty-three, AOCs were identified in the Great Lakes, principally in urban industrial areas. Subsequently one was added and Collingwood Harbor, Ontario, was removed from the list in 1995. Three "binational" RAPs are underway for the St. Marys, St. Clair, and Detroit rivers, 17 are in Canada, and the remainder are in the U.S. For both the Niagara and St. Lawrence River AOCs, two separate RAPs are underway because New York and Ontario have not agreed on binational processes.

Annex 2 of the Agreement calls for the federal governments, in cooperation with the states and provinces, to ensure that RAPs incorporate a comprehensive ecosystem approach, with public consultation on all actions. The Agreement defines impairment of beneficial uses as changes in the chemical, physical, or biological integrity of the Great Lakes sufficient to impair one of fourteen defined uses. The RAP process assumes that restoration of beneficial uses requires an ecosystem approach to management.

The RAP process has three stages. The first phase is to identify the problems and causes of impairments of beneficial uses in the area. The second phase has two parts: to identify appropriate remedial measures, and to identify the parties responsible for the recommended action. The third phase requires monitoring and surveillance of use restoration. The IJC is given two responsibilities for RAPs: to recommend new or previously unrecognized polluted areas for designation as AOCs, and to review and comment on the adequacy of each phase of the RAP process.

In 1995, differing views about the success of the RAPs ranged from considering that they were at the forefront of clean-up programs to frustration at the lack of progress. RAPs have been described as a "blueprint for action" and a means to achieve "ecological democracy" in the Great Lakes.[531] After a decade of effort, 71 percent of RAPs had completed Stage 1 of the process, 18 percent Stage 2, and only 2 percent completed Stage 3 (see Table 9).

A growing literature on the RAP process identifies issues and analyzes reasons for the slow pace of progress. Lack of information is a major reason for slowness in completing Stage 1. On the other hand, identification of linkages between water quality, direct and nonpoint sources of pollution, and atmospheric deposition demonstrates how RAPs can be mechanisms for implementing the ecosystem approach at a practical level.[532]

Intergovernmental cooperation has proved difficult to achieve, especially between New York, Michigan, and Ontario for the connecting channel RAPs. Possible explanations include the need to reconcile the regulatory approaches of different jurisdictions in the binational RAPs and the special difficulties where two essentially parallel RAPs are being prepared for the Cornwall and St. Lawrence rivers. Interestingly, efforts that have been made by the public advisory committees on each side to develop their own coordinating mechanisms in the St. Lawrence and Niagara River RAPs, despite the reluctance of the

governments to participate, are an example of how citizens in many locations have become committed to the process.

In 1996 lack of committed resources at all levels of government to complete the process through all three stages is the greatest challenge to RAPs. In Canada, the RAP program has been sustained by the Great Lakes Action Plan of 1990. Canadian $43 million has been invested in nearly 200 projects overall. Environment Canada, whose budget is being reduced by more than a fourth over a three-year period starting in 1995, has already stated that the commitment it made with Ontario to restore 70 percent of impaired beneficial uses in the 17 Canadian AOCs by 2000 will be "stretched" over a longer period. Ontario has eliminated all contracts for public involvement coordinators, with serious additional cuts for provincial agencies expected in 1997.

Opinions also differ about the ultimate result of the trend toward decreased federal funding. Some regard this trend as a fundamental threat to RAPs while others consider it an inevitable and desirable devolution of responsibility to local communities, where in some cases RAPs have energized local participants. In Waukegan, Illinois, for example, efforts are being made to extend the planning process beyond the original Area of Concern.

The IJC role in evaluating and reporting on each stage of a RAP is the subject of ongoing confusion, with review of RAP reports taking a long time. Problems identified by the IJC itself include insufficient accountability, technological limitations, insufficient enforcement, the need for improved communication and cooperation among RAP groups, and the means to sustain RAP institutional structures and public participation.

Few, if any RAPs, have adopted or integrated the GLWQA goals of zero discharge and virtual elimination of persistent toxic chemicals. The neglect of these goals suggests that governments and RAP constituencies are more interested in having their areas removed from the AOC list than in achieving the overall goals of the GLWQA. Finally, the lack of a legal framework for implementing RAPs has also been identified as a barrier to ultimate accomplishment.

The question remains as to how to measure their progress. One view is that they should be measured not only by the proportion of uses restored but also by the level of community participation in RAP development. Most RAPs have some sort of stakeholder group, coordinating group, public advisory council, or other body to help facilitate public participation, coordinate RAP development, and build institutional capacity. Two commentators summarize the value of public participation and the community-building aspect of RAPs as follows:

> The shared decision-making process facilitated through these RAP institutional structures establishes mutual accountability. It has also restructured traditional relationships between the regulator and the regulated and between the public and the government. This process of involving stakeholders and securing broad-based support has been said to be at least as important as the technical and scientific aspects of RAPs. Unfortunately, the level and nature of community participation in each RAP is different. Moreover, community participation itself has had its challenges in terms of limited technical and financial support, turn-over of participants and the, at times, unequal partnership of the participants.[533]

LAMPs. In addition to RAPs, Annex 2 of the 1987 Protocol noted that lakewide management efforts were already underway for Lakes Michigan and Ontario and stated the parties' intentions "to endorse and build on . . . existing efforts for Lakewide Management Plans, or LAMPs." The concept was that results of RAPs for the local Areas of Concern and LAMPs at the whole lake level eventually could be integrated into a total basin-wide effort on behalf of the entire Great Lakes ecosystem.

The U.S. has sole responsibility for a Lake Michigan LAMP but binational coordination is required for the other lakes. In the U.S., Congress included a legislative

mandate in the 1990 Great Lakes Critical Programs Act with schedules and deadlines for completion for LAMPs as well as RAPS. In a sense, such an ambitious, long-range commitment by the parties affirmed their continuing acceptance of the fundamental goals of the Agreement.

By 1996, processes for development of LAMPs had been established for all five lakes but no environmental results that could be attributed specifically to these processes could be identified. On the other hand, both local officials and citizen participants believed there was value in the interaction between a wide range of interests in the "forums" that had been set up for each lake.[534] The 1996 Lake Michigan Forum work plan described this new Great Lakes institution as a "diverse stakeholder group organized to work in partnership with and supported by the USEPA and the four states to protect and enhance environmental quality . . ."[535]

This language reflected the broader agenda for the USEPA's Great Lakes programs that had developed in the 1990s to include ecological issues beyond toxic contaminant control or even water quality improvement. The first draft Lake Michigan Forum Work Plan in 1993 had emphasized control of toxic contaminants. The 1996 version included objectives and "action steps" to deal with relationships between land use and water quality but several objectives dealt with toxics control.[536]

In addition to continued effort for "sediment remediation," new initiatives were listed for "a pollution prevention/toxics reduction initiative with the primary metals industry" and for finding ways to make use of data to be released from the Lake Michigan Mass Balance Study beginning in 1997. The USEPA study itself was described as an attempt to provide the information on movement of contaminants into and through the basin needed "to construct programs to effectively reduce loadings of critical pollutants."[537]

Development of Other Great Lakes Institutions

During this period some Great Lakes institutions outside the formal Agreement process disappeared but new ones developed. The Center for the Great Lakes shut down in 1993 because of funding difficulties. Industrial interests organized a Great Lakes Water Quality Coalition to oppose the Great Lakes Water Quality Initiative. A Council of Great Lakes Industries was organized to represent business interests in policy debates more generally. A Great Lakes Research Consortium within the State University of New York system was added to academic centers.

The Great Lakes Commission expanded its activities by establishing a binational Great Lakes Information Network (GLIN) that makes a broad range of databases available through the Internet and the World Wide Web (WWW). Both Environment Canada and USEPA's Great Lakes National Program Office also maintain information networks to make Great Lakes databases available electronically from many sources.[538] Exhibits and training in use of the electronic system were provided at both SOLEC meetings.

In 1994 the Great Lakes Commission also issued an Ecosystem Charter. The charter document articulated principles covering a wide range of issues from a number of sources. The intention was to obtain a commitment to the principles by the signatories and to update the charter over time.[539] A number of environmental organizations declined to sign the charter because they said it lacked mechanisms for implementation.[540] By November 1996, 175 endorsements had been received.[541]

3.4 The Period of Change

The years following adoption of the 1987 Protocol brought more change to nearly all aspects of the Great Lakes regime than had occurred in the two previous decades. Many changes are still evolving. They can be considered in terms of changes (1) to the operations of the IJC, (2) to the relationship between the parties and the IJC and (3) to the greater community that has developed around the Great Lakes Water Quality Agreement.

Alterations have occurred in both the internal operations of the IJC and the way the Commission relates to other parts of the community. The major internal changes include the restructuring of and change in mandate of the original advisory boards, the SAB and the WQB, plus the establishment of new advisory mechanisms that include the CGLRM and task forces. Others are the new direct management of the Regional Office by the secretariats of the parties and the change in role of the office staff. The use of a Commission-directed priority setting process demonstrates the new role of the IJC itself in overall management of the binational institutions.

In addition to a new internal management framework, other initiatives of the IJC include reaching out to and inclusion of new constituencies for the Agreement process. The IJC has also broken new ground in seeking to broaden the basis for its recommendations beyond the advisory boards and in its advocacy for using the weight of evidence, precautionary principles and response to public input. One result was the series of recommendations on the use of chlorine which brought the IJC unprecedented national and international attention and made it the focus for direct intensive lobbying by the chemical industry. With all the internal changes, questions remain about the relations to other international institutions whose jurisdictions overlap with those of the IJC, including the Great Lakes Fishery Commission and the Commission on Environmental Cooperation for North America.

Identification and evaluation of changes in the relationship between the IJC and the governments and in the role of the lead agencies for the parties is made more difficult by the lack of a framework or a plan for institutional development following the adoption of the Protocol. Much seems to have depended on the views of agency administrators such as the director of USEPA's Great Lakes National Program Office. The agencies have also had to operate during a period of growing rise of political conservatism and decreasing fiscal resources.

In any case, the staffs of USEPA and Environment Canada have been much less involved in the activities and processes coordinated by the IJC in recent years. The functions of the BEC and the SOLEC are still evolving, although to date they do not seem designed to respond directly to the IJC's need for information, especially on programs, in order to advise the federal governments about progress under the Agreement. To date also, the coordination of work plans called for in the Protocol has not occurred. The change in participation in the WQB raises three questions: First, can the IJC adequately assess the separate or joint reports by the parties? Second, does the IJC have any fact-finding or reviewing functions in the new separate bilateral processes that are comparable to its evaluation role prior to 1987? Three, without the IJC as a forum, how can the binational community participate in assessment of the adequacy of programs?

The delegation in this period of authority and responsibility for environmental management to both the states and the provinces raises new questions about their role in meeting national obligations under the Great Lakes Agreement. Yet in a period in which governments seem to be withdrawing from Agreement processes, RAPs, LAMPs and the special efforts for Lake Superior have expanded participation by local governments, business and industry, and citizens. Results have been unclear so far and the ultimate effectiveness of the processes is uncertain in the face of declines in support and funding.

Finally, Phase 3 was marked by an increased role for nongovernmental participants, especially environmental activists and representatives of industry. The regional and national environmental organizations that had become involved in the 1980s were joined at the biennial meetings starting in 1989 by numerous local grass roots organizations concerned about toxic contaminants. Their presence changed the character of the meetings from exchanges of information between the advisory boards and the IJC to major demonstrations of public opinion. The increased activisim enhanced political support for Great Lakes programs and led to new strong U.S. legislation in support of the Agreement in the U.S. and to major policy developments in both countries.

From 1991, industry participation grew in both biennial meetings and other Agreement-related activities. Industry representatives also began lobbying IJC members and staff as never before.[542]

By the mid-90s, environmental groups in both countries were struggling to maintain their organizational capacity with much uncertainty about the continuing role of the foundations that had earlier been the major source of funding for Great Lakes protection activities. Yet a doubling of attendance of the 1996 SOLEC meeting and the expanded presence of nongovernmental as well as government representatives suggests continuing vitality in the community concerned with the Great Lakes Agreement.

In the U.S., bipartisan support for Great Lakes protection remains in the Congress although it has been diminished by changes in membership and leadership. In Canada, controversy over national unity and cutbacks in government funding for the environment overshadow other questions for the future.

PART 4: EVALUATION OF THE EFFECTIVENESS OF THE GREAT LAKES WATER QUALITY AGREEMENT

This evaluation considers the reasons for the effectiveness of the Great Lakes Water Quality Agreement and in Part 5 considers the factors that may affect its future. The recommendations in Part 6 identify the issues that need to be addressed now by the governments and the community that has evolved around the Great Lakes Agreement. An annex describes recent experience with other regimes for international waterbodies.

The essential finding of this review is that, after nearly 25 years, the Great Lakes Agreement has been effective both according to criteria suggested by Oran Young and because of the essential characteristics identified in this review. Only one of the persons interviewed for this review suggested that the extent of the improvements of water quality in the Great Lakes in the past 25 years would have occurred without the Agreement.[543] Both its past successes and continued effectiveness depend on support for the Agreement by the broad binational community responsible for generating the political will of the governments to achieve its goals.

The Great Lakes community, which is bound together by its continuing commitment to the protection and restoration of the Great Lakes ecosystem, must be counted a major achievement of the Agreement and the principal reason for its effectiveness. The broad community involved in implementation includes scientists, government agency staffs, environmental activists, representatives of industry, private philanthropic foundations, and politicians. The community remains committed to the Agreement's goals of virtual elimination of toxic contaminants and an ecosystem approach, although differences between sectors within the community about how to define these aims have not been fully resolved.

Other contributions include improved relations between the two countries that are party to the Agreement, improved scientific knowledge, and promotion of an ecosystem approach to environmental management. The Agreement's successes also include physical improvements in the Great Lakes, although major problems that were not recognized when the Agreement was developed still threaten ecological integrity.[544] They include historic reservoirs of contaminated sediments that have proved difficult and expensive to remove, continuing input of toxic chemicals from direct and diffuse sources, both inside and outside the Great Lakes basin, and the invasion of exotic species, with decimation of native fisheries and loss of biodiversity.

It is uncertain whether the characteristics that have accounted for the Agreement's successes to date can assist in the regime's adaptation to new circumstances. The community has lost cohesion in recent years with internal changes in the operations of the IJC, changes in the relationships between the Commission and the parties, and diminished capacity in the environmental community.

No forces on either side advocate abandoning the binational accord or even changing its current objectives. Still, its uncertain future depends on the continued strength ability of the binational community that was essential to its earlier achievements.

4.1 Results of the Great Lakes Agreement to Date

The general consensus within the Great Lakes community and beyond is that the chief objectives of the 1972 Agreement have been realized. Success occurred in the following four categories:

1. Reduction of phosphorus and other pollutants;
2. Promotion of toxics control and an ecosystem approach to management;
3. Contributions to science; and
4. Maintenance of stability of the U.S.-Canada relationship.

Reduction of Phosphorus and Other Pollutants

The chief objective of the 1972 Agreement was the reduction of the loadings of phosphorus--which had been identified as the limiting nutrient for triggering algal growth and accelerated eutrophication--together with the elimination of "floating debris, oil, scum . . . "that was unsightly and "materials [that create] a nuisance" because of color or odor. In 1995, the total target loadings set for each lake and the target levels of concentration set for open waters had been maintained for 10 years, except in Lake Erie, where they were exceeded only in 1982, 1984, and 1990 (see Chart 1).[545]

This result was achieved by improved sewage treatment and other measures that were initiated because of the Agreement or which went beyond what was required under existing national laws. In Canada, new federal funding was provided under the Canada-Ontario Agreement. In the U.S., major sewage treatment plants in the Great Lakes basin were upgraded to tertiary treatment to achieve the 1 milligram per liter effluent level required by the agreement when secondary treatment would have satisfied the Clean Water Act.[546] In 1975, a USEPA official noted a higher proportion of sewage treatment grant funds under the Clean Water Act being spent in the Great Lakes following adoption of the 1972 Agreement.[547]

In both countries, the phosphate content of detergents was drastically reduced in the Great Lakes basin. Measures to reduce runoff of agricultural fertilizers launched a national movement toward conservation tillage in the U.S.[548] Within a few years, algae growth had declined throughout the system and fewer beaches were closed. This Great Lakes experience in improving water quality by reducing phosphorus loadings continues to assist in the development of management policies for other water systems.

Promotion of Toxics Control and an Ecosystem Approach to Management

While success with phosphorus was being achieved, research inspired by the Agreement brought new understanding about the nature and extent of toxic contamination and its consequences in the world's largest freshwater ecosystem.[549] With proof that toxic chemicals were being deposited from the atmosphere and leaching from landfills inside the watershed to bioaccumulate in fish tissues throughout the whole Great Lakes system, the Agreement was reviewed and revised in 1978 to call for virtual elimination and an ecosystem approach to management.[550]

During the 1980s, declines in levels in both open waters and fish tissues followed decreases in direct discharges (see Chart 2). Initial concerns about the relationship of fish tumors and abnormal reproduction of wildlife to exposure to a wide range of toxic contaminants were extended to growing concerns about the effects on growth and development of human infants and now the reproductive capacity of adults. With a new review in 1987, the fundamental objectives were retained from the 1978 Agreement with a

new Protocol and annexes calling for new programs to assist implementation. Both the language of the Protocol and its interpretations by the lead parties and the IJC have affected the relationships between the parties and the IJC.

Research continues to reveal wildlife and human health effects from exposure to toxic contaminants but experience has confirmed the complexity and cost of trying to achieve their virtual elimination, as the Agreement requires. Reaching this goal depends on the removal of existing contaminants from sediments and other reservoirs and stopping new inputs in direct discharges as well as from diffuse sources that include the long-range transport in the atmosphere from sources remote from the Great Lakes region.[551]

Much of the major scientific consensus on the gravity of the problem for nature and for humankind developed in response to research conducted in the Great Lakes basin. Now the effort to understand and control toxic contamination that began in the Great Lakes is being pursued in many parts of the world and is supported by ongoing change in policy and regulatory concepts in Canada and the United States.

The understanding about the difficulty of reversing toxic pollution gained in the Great Lakes has caused both governments to recognize the need for pollution prevention through changes in industrial processes. Use of sunsetting, or banning, protocols, weight of evidence in determining when such drastic action is needed, and the precautionary principle in determining safety of chemicals have all been explored. The 1994 Great Lakes Water Quality Initiative in the U.S. introduces the concept of the need to regulate persistent bioaccumulative chemicals in a different way than conventional pollutants that break down or decompose in the environment. In Canada it could be argued that the 1994 Chlorine Action Plan and the 1995 Toxic Substances Management Plans were both federal responses to IJC recommendations coming out of the Great Lakes Agreement process. In 1996, the negotiations of agreements on the use of persistent organic pollutants (POPs) under the United Nations Environment Program and the Convention on Long Range Transboundary Air Pollution by the United Nations Economic Commission are both influenced by information from the Great Lakes. Canada, for example, has called for the "virtual elimination" of persistent and bioaccumulate toxic substances, presumably because of experience under the GLWQA.[552]

Confirmation of the multiplicity of sources and effects of contaminants in the environment led to the pioneering call for an ecosystem approach to management in the Great Lakes regime in 1978 and, again, experience here has had wide influence elsewhere.[553] In 1989 USEPA Administrator William Reilly cited Great Lakes experience in calling for a new approach to policy based on the maintenance of ecosystem integrity rather than just pollution control.[554] The Sierra Club used the Great Lakes as a model in restructuring its advocacy program around ecosystems rather than around single issues.[555]

Another stage in the evolution of ecosystem management appears to be underway in the 1990s in the RAPs and LAMPs called for in annexes to the 1987 version of the Agreement.[556] These processes seek to apply an ecosystem approach at the local level in the RAPS and lakewide for each lake in the LAMPS. Both sets of remediation plans call for attention to habitat restoration, preservation of biodiversity, and fishery issues as inextricably linked to water quality. One observer said that implementation of the Great Lakes Agreement now involves "bottom-up planning with top-down planning with the Great Lakes in the middle."[557]

More evidence of the importance of the Great Lakes Agreement to the evolution of environmental management in this region has been found in the comparison of water quality management efforts in the Great Lakes with those of three other large North American aquatic systems: Chesapeake Bay, Puget Sound/Strait of Georgia, and Long Island Sound. Geographic and environmental circumstances differ between these three ecosystems, but the existence of the Agreement appears to account for dramatic differences in the Great Lakes and the other regions under the Clean Water Act.

In Chesapeake Bay, nutrient pollution "continued to worsen" until 1987, despite the 1972 Clean Water Act, at the same time that phosphorus loadings were being reduced in the

Great Lakes. Long Island Sound still had critically low dissolved oxygen levels in 1989. In Puget Sound, where U.S. waters meet Canadian waters from the Strait of Georgia in the Strait de Juan de Fuca, toxic contamination is of more concern than nutrient pollution, but has received far less attention and far later than in the Great Lakes.[558]

In the Great Lakes, the binational accord has provided the framework for governments and private interests to respond to converging events and new knowledge gained from experience and research.[559] Recognition of the value of such a framework appears to be the reason that the states of Maryland, Pennsylvania, and Virginia, with the District of Columbia, signed a Chesapeake Bay Agreement in 1983; and that British Columbia and the State of Washington signed an Environmental Cooperation Agreement in 1993.[560]

The Great Lakes Agreement has also created the context in which control measures for toxic contaminants were incorporated into new laws and programs, most of which have benefited other water systems as well. The Great Lakes Initiative introduces the regulatory concept in the U.S. that permits for the discharge of persistent bioaccumulative substances must take more factors into account than for conventional pollutants, including potential consequences for human and wildlife health as well as the direct effects on aquatic life.[561] Still another example is the development of a national program on contaminated sediments following the recognition that they can be an ongoing source of toxic substances that may prevent restoration of water quality even if new discharges are eliminated.[562]

In Canada, Ontario's MISA program was shaped by the goals and objectives of the Great Lakes Agreement and the province has developed a list of substances that are candidates for bans and phase-outs of use.[563] Both federal and provincial environmental officials often use Great Lakes meetings to announce new programs and policies to demonstrate their commitment to the Great Lakes. It could be argued that the federal Chlorine Action Plan of 1994 and the Toxic Substances Management Plan of 1995 are also responses to the IJC recommendations on chlorine.[564] Reflection of the same trends in recent proposals to amend the Canadian Environmental Protection Act demonstrate how the Great Lakes experience is influencing national environmental policy in Canada.[565]

Another contribution is the demonstration that success in environmental management is possible for a large ecosystem even when success depends on the actions of many different jurisdictions at every level of government, as with phosphorus control. Binational programs that do not exist elsewhere include the Integrated Air Deposition Network monitoring program, which gathers information about toxic contaminants, and other water quality and fish monitoring programs that have contributed to the largest existing database for freshwater systems.[566] Attention to land use, habitat protection, and biodiversity in the new SOLEC process appears to be broadening the approach even more.

While an ecosystem approach to management integrating control and prevention of pollution from land, air, and water has not yet been wholly achieved in the Great Lakes basin, the Agreement is the reason for progress toward this end. None of the other three areas of comparison mentioned above had regional management plans until the late 1980s. Nor does a process exist elsewhere that corresponds to the Remedial Action Plans that involve federal, provincial, state, and local governments with industry, environmentalists, and local residents in developing cleanup plans. The most comparable program is the Quebec ZIPs, which follow the RAP model.[567]

Contributions to Science

All of the environmental management efforts and innovations under the Great Lakes Agreement have depended on the knowledge of the network of individuals and research institutions that the IJC in 1993 called " . . . a large community of knowledgeable, committed environmental scientists."[568] In the 1960s scientists initiated the binational joint factfinding work on eutrophication that led to the original Agreement. The community

expanded to collect, analyze, and disseminate information needed to develop appropriate measures for reducing loadings and then to measure results.[569]

The discovery of concentrated contaminants in fish tissues was followed by the identification of the multiplicity of ways in which they enter the lakes and affect not just aquatic life but wildlife that depends on the lakes for food and human health through fish consumption.[570] The most comprehensive research commitment in the 1990s is for mass balance studies of how toxic contaminants cycle within the ecosystem between air, water, land, and biota.[571] Results are expected to expand the database for the Great Lakes, already considered the most complete for any large aquatic ecosystem in the world.

Through the implementation processes required by the agreement, the scientific information has been shared not only with other scientists but also with the entire Great lakes community. Shared knowledge in turn has led to concerted support for policies and programs to achieve Agreement goals in both countries.

The U.S.-Canada Relationship

The Great Lakes Agreement expanded the aims and operating principles of the Boundary Water Treaty to establish an ongoing process by which two different nations with different political systems, different cultures and populations, and unequal economic power address their mutual concerns for a shared hydrologic system essential to both countries.[572] Avoiding disputes by identifying and dealing with problems together, as parties to the compact, Canada and the U.S. are peaceably accountable to each other as well as to the binational community that has developed around the Agreement and to the larger publics on both sides.

Even when they have disagreed on other issues such as acid rain or whether equal effort was being made for the Great Lakes, through most of the life of the agreement the parties to the Agreement have continued working together through the joint institutions of the IJC. Their participation in a separate process to address the toxic pollution of the Niagara River from hazardous waste disposal sites on the U.S. side was due to their joint commitment to the goals of the Great Lakes Agreement.[573]

The language of the 1987 Protocol called for more direct interaction between the parties but the Agreement remains the foundation for bilateral interaction between the lead agencies, USEPA and Environment Canada.[574] In the 1990s they began to interact through a new Binational Executive Committee (BEC) rather than through the IJC. Internal changes in the operations of the IJC that resulted from the Commission's interpretation of the Protocol have reduced interaction between the Commission and the lead agencies, but the relationship of the two countries remains stable for the Great Lakes as they struggle with economic and trade issues and changing domestic political forces.

4.2 Features Contributing to the Effectiveness of the Great Lakes Regime

The previous discussion argued that the results of the Great Lakes Agreement demonstrate its effectiveness during the first 25 years in several ways. This section identifies seven features that account for the vitality of the Great Lakes regime. These characteristics supported past effectiveness. The question now is whether they are sufficient with the challenge of new external political, economic and social factors and the internal changes within the regime. They are:

1. Promotion of community;
2. Binationalism;
3. Equality and parity in structure and obligations;
4. Adoption of common objectives;
5. Provisions for joint factfinding and research;
6. Flexibility and adaptability to changing circumstances; and
7. Accountability and openness in information exchange.

Promotion of Community

It is unlikely that the architects of the Great Lakes Water Quality Agreement anticipated that the strength of the Agreement was not only in its provisions for achieving objectives but also in the evolution of a powerful binational community committed to its implementation. Members of this community have a sense of belonging because they know and interact with each other in a place--near and among five of the greatest water bodies on the planet--which has special value for them and where they live and work. They not only share commitment to the goals of the Agreement, they expend energy for their achievement, either within the processes of the Agreement or in other arenas such as Congress or a Parliament, a state legislature, or a public advisory committee for a RAP.

Members of the community include the personnel of government agencies at federal, state and provincial, and local levels, and of research institutions, whether governmental, academic, or private. Members and staff of environmental organizations, representatives of labor, of native peoples, and of industry also belong. Many political leaders should be counted in, not only because they respond to their constituencies but also because many have demonstrated a strong personal commitment to the protection and restoration of the Great Lakes. Institutions that support the community or have resulted from it include private philanthropic foundations, the Great Lakes Fishery Commission, the Council of Great Lakes Governors, the Great Lakes Commission, and dozens of others that often serve Great Lakes interests outside the basin whether in Ottawa, Washington, or beyond.

The depth and diversity of what has been called the "institutional ecosystem of the Great Lakes" was reflected in more than 700 entries in the 1984/85 *Great Lakes Directory of Natural Resource Agencies and Organizations*.[575] All but a few survive in the 1990s but new ones have emerged. The Center for the Great Lakes shut down in 1993 and the Great Lakes Protection Fund began operating in 1990.

Development of the Great Lakes Agreement converged with the emergence of the North American environmental movement and has provided a major focus for environmental activism in the Great Lakes basin throughout its history.[576] Only scientists and government officials were directly involved in the IJC factfinding process that preceded the signing of the original Agreement, but their efforts converged with rising public concern about water pollution and other environmental issues.[577] Results of the 1964 reference with the recommendation for a binational agreement were reported in 1970—the same year as the first Earth Day, which many consider the date the environmental movement was launched as a political force.[578] Most accounts of the origins of the Agreement attribute the parties' acceptance of the proposal for a binational accord for Great Lakes cleanup to growing public pressure for government action against pollution in this period.[579] The Lake Michigan Federation—the first regional organization to protect a Great Lake—used Lake Erie's fate to stimulate public concern and saw the Agreement as an opportunity to gain protection for the larger lake.[580]

From its conclusion in 1972, and increasingly for two decades, the regime that resulted from the Agreement provided the major forum for environmental activism and the growth of the binational community described above. Through the 1970s, Great Lakes environmentalists were more influential in the United States, where there was more opportunity to use WQB and SAB information to lobby Congress and the states on such issues as funding for sewage treatment, phosphate detergent bans, and attention to PCBs. As the first decade of the Agreement proceeded, Canadian activists talked with their U.S. counterparts at IJC annual meetings about how to influence policy for Great Lakes protection more effectively in their own country.[581]

The organization of Great Lakes United in 1982 led to coordinated binational activism for the Great Lakes and expansion of the Great Lakes environmental community in both countries. The new coalition's organization was facilitated by support from foundations that expanded their environmental programs in this period and then decided to focus them on the Great Lakes. It was also strengthened by the involvement of the United Auto

Workers, the labor union with the most membership in both countries. First Nations in Canada and tribal councils of Native American groups in the U.S. also joined the coalition and were formally recognized as representing independent nations in 1989.[582]

From 1983 on, the GLU annual meetings and the biennial meetings of the IJC served as gathering places for an increasingly broad spectrum of environmental organizations. Participation grew to include local groups organized around a single issue, Great Lakes units of national groups like the National Wildlife Federation, Sierra Club, and National Audubon Society, and the international organization Greenpeace, which established a special Great Lakes program. By the end of the 1980s, most major environmental organizations on both sides of the border, such as Pollution Probe, the Canada Environmental Law Association, the Lake Michigan Federation, and Citizens for a Better Environment, were knowledgeable about and participated in Great Lakes policy debates.

The political presence of Great Lakes environmental activists in Washington was increased in 1986 by the organization by the Sierra Club of an annual Great Lakes Week to lobby Congress on Great Lakes issues. Activities included events such as a formal reception for the Great Lakes Congressional delegation on Capitol Hill—co-sponsored by the UAW—and special meetings with USEPA and other agency administrators.[583] A less elaborate set of activities was also scheduled in Ottawa in some years.

In this same period, GLU developed a strategy to take advantage of the growing public concern about toxic contamination, strengthen the binational coalition, and influence the review of the Agreement scheduled for 1987. The 19 public hearings throughout the basin increased pressure on the governments for control of toxic contamination by holding them more accountable for the objectives of the 1978 Agreement.[584] Representatives of environmental organizations subsequently participated in negotiations of the 1987 Agreement.[585]

Outpouring of public concern about toxic contamination at the 1989 meeting in Hamilton influenced the IJC to make recommendations on chlorine and led to the new involvement of industry.[586] Subsequent biennial meetings continued to serve as a forum and the largest gathering place for the Great Lakes community.[587]

Both the growth of the community and its role continue to be dynamic. Although they worked on Great Lakes issues, such as phosphate detergent bans, in the 1970s only a few staff members of environmental organizations or volunteer activists attended IJC meetings or tracked government actions directly related to the Agreement. Involvement of both individuals and organizations expanded in the 1980s as IJC processes became more accessible, in part in response to activist demands, and as more leaders became familiar with the issues and Agreement institutions.[588] First Nation and tribal representatives demanded full recognition of independent sovereignty in 1995 because they did not feel part of the community, although they had been represented in Great Lakes United and included in some IJC activities for several years.[589]

Industry participation expanded in the third decade since the Agreement was signed. Although the reason was the desire of companies to protect their interests in development of policies and regulations that would affect their operations, industry representatives became a part of the community by participating in the processes and institutions by which the Agreement is implemented.

Factors that influenced the establishment and evolution of this community included the Agreement's provision for public information services through the Great Lakes Regional Office of the IJC and the initiation of citizen advisory panels in the PLUARG study. The inclusion of nongovernmental participants in workshops, the Science Advisory Board and its committees and work groups and other activities facilitated interaction between environmentalists, government personnel, and scientists concerned about the presence of toxic contaminants being revealed by research.

Over time, the community gained influence in the protection of the regime's interests in Ottawa and Washington by advocating the retention of programs threatened by funding cuts or the institution of new programs to address problems. Environmentalists first

proposed the amendment that recognized the Great Lakes Agreement in the U.S. Clean Water Act and tracked the development of the COAs in Canada.[590] The Great Lakes Weeks in Washington increased interaction between members of Congress and the Great Lakes Commission representing states, labor unions, and environmental organizations, often with Canadian participation.

Above all, the existence of the community continually advocates and holds legitimate the goals of the Agreement. For example, environmental groups refused to sign the Ecosystem Charter because they said it was not strong enough to secure full implementation of the Agreement's goals. On the other hand, the fact that the Charter gained so many diverse signatories demonstrates the wide commitment to the overall goals and objectives of the Water Quality Agreement.

Many members of the community interviewed for this project observed that the community is the source of the political will by the governments that has been essential for the Agreement's successes. Some expressed concern that recent changes in the processes of the Agreement may be undermining the capacity to maintain continuing progress. Others noted that the cohesion of the community may be loosening because of organizational problems, including lack of funding, and because of the development of other forums dealing with overlapping issues such as the Commission for Environmental Cooperation of North America.

At a January 1996 strategic planning meeting for leaders of Great Lakes environmental groups, organizational management and the need for funding were the focus of attention, although there was discussion about the need for a new vision to inspire new energy for protection.[591] Now with continued support from regional foundations, Great Lakes United is working actively with other groups to reinvigorate the regional network of environmental organizations.[592]

Binationalism

The binationalism that historically has characterized most of the operations of the IJC has also been essential to the success of the Great Lakes Agreement. The most singular feature of the IJC is its status as a single independent entity. The Agreement requires that Agreement goals be the focal point of the operations of the advisory boards and that identification of problems and solutions be undertaken cooperatively and collectively.

As related in the history of the Agreement, the theory of binationalism is that it creates a forum in which government officials can serve in effect as international civil servants. The advantages of this approach include the opportunity for agency policymakers to discuss matters without home agency constraints, plus the opportunity to help fashion solutions that an official can then sell to his home agency with an understanding of how other jurisdictions will approach the problem. Binationalism creates an environment conducive to consensus, since separate interests are set aside for the broader transnational interests.

Binationalism is not the same as a bilateralism. With binationalism, the common interest supercedes separate interests, while bilateralism involves two parties that negotiate with national interest as the controlling factor. Experience under the Great Lakes Agreement demonstrates the strength of the binational approach.

The ways that recent changes in relationships and operations within the Great Lakes regime have affected its binational character are the reason that the changes should be considered critically. Beginning in the early 1980s, the IJC itself began to operate more in terms of national sections, a trend enhanced by more recent activities. In general, there is now less participation by government representatives, especially senior government officials, in IJC activities. The result is less interaction between the agencies of the parties and other parts of the community.

Partly in response to growing resource constraints, in the mid-1980s USEPA and Environment Canada sought to commit less effort to IJC activities. At the same time, Great

Lakes United led environmentalist efforts to increase the accountability of the governments for the lack of progress toward virtual elimination of toxic contaminants. Both efforts converged in the 1987 Protocol that directs USEPA and Environment Canada, with other federal agencies and the states and provinces, to confer twice a year on progress and workplans.

Slow to start, the new arrangement has evolved into the BEC. To date, the chief function of the BEC has been to plan the 1994 and 1996 SOLEC meetings, which aim mainly to involve "decisionmakers." There has been no public involvement in the BEC, although members voted in July 1996 to allow outside observers of the interactions between the official representatives of the agencies.

As discussed earlier, the withdrawal of policymakers from the WQB has left this critical component of the earlier binational process without a mission. The aim of the 1987 Protocol was to increase the accountability of the governments and commitment to the concept of the Agreement still seems to be accepted on both sides. Yet recent interaction of the parties outside of the joint institutions of the IJC and without nongovernmental oversight appears to be regressing into country-to-country negotiations and exchanges of views. This change is undermining binationalism in the institutional framework and could be a factor in the recent diminished vitality of the broad community that developed out of a unified process serving the goals of the Agreement, and the Great Lakes, rather than national interests.

Canada, in particular, should be concerned about the potential loss of binationalism. Its leverage to influence U.S. policy is far greater within a binational context than through party-to-party negotiations. The U.S. should also be concerned about losing the opportunity to maintain its "special relationship" with its northern neighbor.

Finally, all members of the Great Lakes community should be concerned about the replacement by a conventional relationship of a successful binational process that recognizes the importance of ecosystem integrity. It is too soon to reach final conclusions about the work of the BEC and the results of the party-to-party relationships outside the IJC umbrella, but it does not and can not replace the benefits of a binational structure for the Great Lakes ecosystem.

Equality and Parity

Like the Boundary Waters Treaty on which it is based, the Great Lakes Agreement assumes equality and parity between the parties in the structure of its institutions and in their obligations. Each side has the same number of members on the IJC, the advisory boards, and any special task force, committee, or work group. Costs, such as for the Great Lakes Regional Office, are also shared equally.

This equality is essential to assure equal respect when there is such disparity between the economic resources, political power, and size of the population as exists between the U.S. and Canada. Although it may be more important psychologically to Canadians, this principle is important to both sides because, with mutual respect, it helps maintain stability and commitment in the relationship.

In nearly all cases, the same principle is adopted by the governmental, nongovernmental and private institutions and organizations in the Agreement community. Both IAGLR and GLU, for example, alternate their meetings between each country and divide governance responsibilities equally on their board of directors. Meetings were even alternated in the mid-1980s study of progress under the Agreement by the Royal Society of Canada and the National Research Council, and in the series of four interuniversity seminars that have considered agreement-related issues at intervals during the life of the Agreement. In a joint meeting of planning associations of Ontario and Michigan in the early 1980s at Sault Ste. Marie, daily sessions alternated on each side of the border.[593]

To date, the principle is also being applied in the new bilateral activities of the parties since the 1987 Protocol. The first SOLEC conference was held in the U.S. in 1994, while

the second in 1996 was in Canada. Costs were shared equally for the first meeting and there was equal participation in planning by the steering committee and in the preparation of background papers. The BEC meets once a year in each country. One of the findings of this project is that the principle should continue to be applied by the parties when they work directly together rather than through the IJC in order to preserve the mutual respect and sense of community that has proved so valuable in the past.

The issue of "equality and parity" is complicated by the importance of the states and provinces in implementation of the Agreement, which will grow if the current trend of the decentralization of responsibility from the central governments continues. Moreover, First Nations (as they are known in Canada) or the tribal councils of indigenous populations (as they are known in the U.S.) are increasingly questioning their role and asking for recognition of their status as separate entities.

Common Objectives

Another key feature of the Great Lakes Agreement is that it states common objectives for the ecosystem that have been adopted by both governments. Mutual respect is further maintained by allowing the common objectives to be achieved under the laws and management programs of each side. Thus the Agreement recognizes that the two countries have different political systems and cultures even though, in large part, they share the same language, some history, and some national origins.

This principle allows each side to complain about the adequacy of the other's efforts without forcing the acceptance of the same approach. Disagreement does not necessarily lead to a parting of the ways. In practice, this principle of the Agreement has allowed negotiation toward mutual agreement and even in some cases adoption by one party of an approach used by the other. Canada, for example, adopted a national standard that reduced but did not eliminate phosphates from laundry detergents. In the U.S. the states banned all phosphates in laundry detergents but allowed their continued use in dishwashing compounds for sanitary reasons.

The parties agreed that the difference was justified because of the much higher total loadings from the U.S. side. Both approaches served the common objective of reducing phosphorus loadings to the Great Lakes and achieving a 1 milligram per liter effluent limit for large municipal sewage treatment systems.

More recently, Canada moved toward the U.S. approach of setting specific limits for toxic chemical discharges in industrial effluents in Ontario's MISA program. The new approach adds effluent limits that are negotiated for each source in Canada but set in discharge permits under the Clean Water Act in the U.S.

In other cases, both sides have taken essentially the same action in, for example, banning most uses and the manufacture of DDT and PCBs. Although not required by the Agreement at the time, the bans serve its aims. At present, the concept of additional bans and phase-outs of use of toxic contaminants has more acceptance in Canada than in the U.S., where current policy stresses risk reduction rather than elimination of all use.

The draft "Binational Virtual Elimination Strategy," released in September 1996, demonstrates both the best and the worst use of "common objectives." In that document, the governments have agreed to certain reduction targets and activities for listed substances. At the same time, some of the targets are different for the U.S. than in Canada, apparently because the Canada-Ontario Agreement was used as the basis for Canadian goals.[594]

Joint Factfinding

The Great Lakes Agreement applied another principle of the Boundary Waters Treaty in the requirements for joint factfinding and research, though in a different way. Under the Treaty, the factfinding process is used on a case-by-case basis to respond to a reference or a request from the governments for advice on a specific problem. Under the Agreement,

both sides are also obliged to carry out ongoing research and monitoring together through the IJC and separately in their own research programs.

Research that is undertaken through the IJC has generally been coordinated through the Regional Office and undertaken under the auspices of the advisory boards. The two (now three) boards, especially the SAB, may at times undertake a special factfinding process similar to the way the ad hoc expert boards operate for a reference. For example, such a factfinding process has been undertaken on the human health effects of toxic contaminants and on the cause and effect linkages between exposure to contaminants and reproductive problems in wildlife.[595] The WQB asked the SAB to help determine a list of critical pollutants.[596] More recently, the IJC itself has begun to establish special task forces for the same kind of purpose.

The Agreement goes beyond the Treaty in recognizing that ongoing research is needed to achieve the ultimate goal of water quality restoration and the preservation of ecosystem integrity in such a large and complex system. It also calls for ongoing joint monitoring to measure progress and help identify new problems.

Research that serves Agreement purposes is carried out by programs established to serve Agreement needs, as well as by many other agencies. Most physical and biological research is funded by the governments, but policy research (as well as advocacy) is also funded by philathropic foundations.[597] Recognition of the value of continued research (as well as advocacy) was the reason that the Great Lakes Protection Fund was established by the Great Lake states.[598] A few independent researchers operate outside agencies and institutions such as universities.[599]

The Agreement directed that the Regional Office help coordinate research but this function now mainly is limited to tracking Agreement-related research in the inventory assembled by the CGLRM.[600] Efforts to maintain the binational GLISP monitoring program in the 1980s have largely been abandoned in the 1990s and the IJC has limited access to the results of separate monitoring or research by the parties. Some Regional Office staff in 1996 were not familiar, for example, with the huge mass balance study being carried out by the USEPA for Lake Michigan.

Joint factfinding and research serves Agreement purposes in several ways.

First, just as joint factfinding has enhanced the credibility and objectivity of the IJC throughout its history, it has generally provided an objective basis for IJC recommendations to the governments for the Agreement. Even for the controversial 1990s recommendations on chlorine, the IJC had a large database about consequences of the chlorinated compounds in the Great Lakes ecosystem.

Second, research has assisted accountability by outlining progress, or lack thereof, toward Agreement objectives, most completely for slowing eutrophication but also for reduction of toxic contaminant levels as well as for their effects.

Third, research has identified problems not previously recognized, most notably the presence and serious consequences of toxic contamination. Fourth, research assists the flexibility that characterizes the Great Lakes Agreement and which is essential to the goal of an ecosystem approach to management. Fifth, research is the basis for participation of a Great Lakes research community that is integrated to and assists the larger community.

The factfinding has evolved with the regime. One of the outgrowths of the fact-finding was the development and acceptance of new concepts to respond to the challenges posed by the complexity, uncertainty, and controversy about the effects of toxic chemicals. The precautionary approach and the weight of evidence approach provide a guide about how to make decisions in the face of uncertain science. Such policy innovations must be seen as important contributions of the regime within and outside the Great Lakes region.

A key finding of this review is that the capacity of the IJC to collect and analyze data has declined. The change in the WQB mandate from evaluator of government programs and progress toward meeting Agreement objectives to policy advisor to the IJC created a gap in the gathering and analysis of information. This gap creates questions about who now

assesses the adequacy of government efforts or oversees data collection and monitoring of water quality and ecosystem integrity.

Assumption of these tasks outside the oversight of the IJC means that comprehensive information about the results of programs is not gathered systematically. The information that is reported separately by the parties to the IJC is no longer subject to the joint review and scrutiny of the agency policymakers, who no longer participate. Without the knowledge of programs that comes with interaction and information exchange between the IJC and agency staffs, the IJC has little capacity to assess the information that is provided.

The SOLEC gatherings are intended to replace the WQB's former "state of the lakes" review but does not provide an assessment of programs. The agenda for the meetings and the information provided is determined solely by the lead agencies and does not result in recommendations by the WQB to the IJC about deficiencies in programs, needed changes, or possible new actions. Neither to date has the SOLEC process provided information in a form that could be used by the news media to communicate the general "state of the lakes" to the general public.

Flexibility and Adaptability

One of the most unusual characteristics of the Great Lakes Agreement is its built-in flexibility. It has the capacity to apply new knowledge and to adapt the objectives of the Agreement to changing circumstances. This flexibility results from the periodic reviews that are required not only to assess progress but to allow changes in the Agreement.[601] Adaptability depends, as noted above, on ongoing research and monitoring and on open information exchange within the broad community. Although deadlines may be set for specific actions, these features acknowledge that change is the most constant feature of both the natural environment and the Agreement process.[602]

Such flexibility also acknowledges that new problems may be recognized even if some problems are solved. Moreover, the Agreement does not require that new problems be addressed in the same ways as problems were addressed formerly and even allows fundamental changes in approach. Such a process also allows for the possibility of replacing objectives if problems are resolved. Thus, after research revealed the extent and seriousness of toxic contamination while efforts were underway to slow eutrophication under the 1972 Agreement, the review required after five years resulted in the very different version that was signed in 1978.

Again in 1987, the review resulted in some changes in the process without any comprehensive expansion of objectives. The changes responded to the desires of the parties to rely less on the Regional Office for coordination and to environmentalist and public concerns about the need for greater accountability for the governments for in the control of toxic contamination.

One significant change directed the parties to coordinate their annual work efforts directly with each other rather than through the IJC, something that should be addressed in the next review because it is not occurring.[603] Another change required the parties to maintain far more extensive lists of toxic contaminants so that more definitive information can be developed about which substances require "virtual elimination."[604]

Other changes built on past experience to make future efforts less difficult. The new requirement for RAPS, for example, responded to a recognition that correcting problems in the Areas of Concern would require the involvement of local as well as state and provincial and federal authorities.

As discussed in the history of the Agreement, significant changes in the binational institutions, including the IJC itself, have occurred since the 1987 Protocol on the initiative of the Commission rather than in response to the Agreement itself.[605] The flexibility of the Agreement all the continuation of those new approaches that prove worthwhile and the further change for those that do not. The opportunity for the involvement of the entire Great

Lakes community in evaluating the need for change is due to these processes for accountability and the openness of the Agreement processes.

While the IJC rightly seeks more efficient use of the available resources in the priority-setting process that it initiated in 1991, it should re-examine how resources are provided to the advisory boards. The SAB in particular needs to have resources that will allow it to identify emerging issues for the WQB and the IJC. Without such resources, the flexibility and capacity for adaptation that distinguishes this international governance arrangement from most others is of less value.

Accountability and Openness

Several features of the Agreement bring about the accountability and openness that in turn foster the involvement by a large inclusive community, outside of the governments, in its processes. One feature is the requirement for periodic review. Another is the requirement for regular progress reports by the advisory boards to the IJC and by the IJC to the governments, to be followed by the governments' responses to recommendations from the Commission. All parts of this process are open to public scrutiny.

A third contribution is the requirement that the Great Lakes Regional Office provide "a public information service for the programs of the Agreement."[606] Here is an example in which the interpretation is perhaps more important than the words, for the IJC has expanded the concept and the practice of providing public information. The Agreement gives the IJC discretion about publishing reports, but in fact the Commission has published and made great efforts to distribute all of the multitude of reports developed by the advisory boards and itself through the life of the Agreement.

The IJC does not just allow members of the public to observe its own institutions in action; it includes representatives of environmental organizations, professional organizations and industry as members of the bodies. Participation in recent roundtable discussions has been by invitation but the biennial meetings have been open to anyone. At times, special efforts have been made to reach out to the public; for example, by holding SAB meetings at various locations around the basin or by paying for chartered busses to carry attendees to a biennial meeting.[607]

In the 1990s, the commissioners have made greater effort to participate in person in a broader variety of Agreement-related events. Contact has been initiated with interest sectors, such as physicians, that had not been involved previously. The IJC takes special pride in its expanded efforts to promote environmental education in schools.

In general, the governments have also maintained a policy of openness, publishing many documents and involving nongovernmental participants in Agreement-related activities. With the July 1996 decision to allow observers, the BEC will apparently will operate in accordance with the usual norm within the Great Lakes community.[608]

The Agreement itself requires accountability in several ways. Article 7 requires at least biennial progress reports. Article 9 is entirely concerned with "submission and exchange of information" between the IJC and the parties and between the parties themselves. Again, full disclosure of information to the public has been the practice and accountability has also been demanded within the larger Great Lakes community, especially by the U.S. Congress.

The General Accounting Office has made several special studies of the Agreement.[609] Frequent Congressional hearings have offered private groups the opportunity to testify about actions needed to further Agreement objectives. Such hearings at times have required USEPA officials to explain their programs and allowed testimony by IJC members, including Canadians.[610]

This project concludes that the Agreement's accountability mechanisms have furthered the development of the binational Great Lakes community so critical to its success but that some of the mechanisms have not been working as well in recent years. The scope and substance of the reports of USEPA and Environment Canada to the IJC are less

ambitious. Lack of understanding of the SOLEC process, deepened by lack of explanation by the agencies in charge, contributed to the lack of NGO involvement in the initial event in 1994.

If the lack of understanding by both environmental organizations and the general public about the recent changes in the role of the parties or the reasons for them causes a withdrawal from participation in Agreement process, the withdrawal will inevitably lead to a decline in political support and the resources available for Agreement purposes. The community at large needs to understand why the parties are expanding their attention to habitat preservation and biodiversity while the IJC continues to focus on control of toxic contamination and human health.

Accountability is an issue even for the IJC biennial meetings. The sense of common purpose was strengthened when the IJC meetings provided a forum for substantive reports from the parties on progress made in meeting the Agreement objectives. By promoting direct interaction between nongovernmental participants, scientists, and agency personnel, the meetings helped keep the parties accountable for actions or inactions.

The deemphasis of the information exchange within the community in favor of a forum to hear views from all the stakeholders has produced mixed results in recent years. While the lead agencies and the parties are able to hear more and directly from various constituencies, accountability on progress has dramatically decreased, with the loss of a sense of shared commitment to the objectives of the Agreement.

4.3 IJC Continuity and Effectiveness of the Great Lakes Agreement

Inevitably, as recognized in the Agreement itself, new players and new circumstances must take over leadership and the day-to-day functions involved in such a long term process. Yet new participants need to know what has happened before their time in order to build on, rather than to lose the benefit of, earlier experience.

The IJC, the lead agencies for the governments, and environmental organizations have acquired new leaders in the current decade who must operate in the current political context of their time. The most wholesale changes have occurred in the membership of the IJC, which is now replaced with every change in administration in the U.S. and changes in government in Canada's parliamentary system.

The new members require time to learn the issues and until they are ready to take charge must inevitably, as in any bureaucracy, depend more on their staffs than if there was some continuity of membership. The importance of the IJC in maintaining the effectiveness of the Agreement processes requires that the governments consider how best to assure that the Commission to build on past effectiveness while exercising flexibility in order to improve Agreement processes. Other factors that may affect continued effectiveness of the Great Lakes Agreement are discussed in Part 5.

4.4 Application of Young's Criteria to the Great Lakes Regime

In addition to identifying the characteristics of the Great Lakes regime that have accounted for the results of the Great Lakes Agreement to date, this review has also considered its effectiveness according to the criteria proposed by Oran Young for international governance arrangements. Most of the characteristics discussed above are also factors in one or more of the six criteria that he proposes. They are:

1. Effectiveness as problem-solving;
2. Effectiveness as goal attainment;
3. Behavioral effectivenss;
4. Process effectiveness;
5. Constitutive effectivness; and
6. Evaluative effectiveness.

Problem Solving

An obvious criterion of effectiveness is whether regimes solve the "problems that motivate parties to create them in the first place." The Great Lakes regime successfully addressed the major problem of accelerating eutrophication that brought the 1972 Agreement into existence.

The reservoirs of past pollutants and the long retention times for the Great Lakes system mean that restoration of ecological integrity will likely require many decades. The huge size of the system and the multiple jurisdictions responsible for its management mean that efforts must continue to integrate all protection efforts.

Currently, there is need for more integration between the efforts of the Great Lakes Fishery Commission and the IJC, and between the efforts to restore habitat and biodiversity and the efforts to eliminate toxic contamination. Still, progress has also been made toward applying an ecosystem approach to management and toward eventual elimination of toxic contaminants.

The need for an ecosystem approach has been accepted in national policies and programs and in the way business is conducted, with more and more industries now adopting pollution prevention as a corporate goal. The eventual success of toxic control is made more likely by the expanding knowledge base about persistent bioaccumulative contaminants and the Great Lake community's commitment to GLWQA goals.

Goal Attainment

Young's second criterion is the "measure of the extent to which a regime's (stated or unstated) goals are attained over time." Closely related to problem solving, goal attainment considers specific and often measurable goals, targets, benchmarks, etc. It is a separate criterion because attainment of a specific goal does not always solve an overall problem.

In the case of the Great Lakes, substantial attainment of the phosphorus goal for large sewage treatment systems did help slow eutrophication. Moreover, the regime identified and instituted other means to reduce phosphorus loadings as well.

Since the Great Lakes "problem" was redefined to include toxic contamination, progress was made toward the ultimate goal of "virtual elimination" by reductions in both loadings and the levels of persistent, bioaccumulative substances in Great Lakes waters. Determination of success in abating the effects of toxic contamination from the past is made more difficult by the long lag time before the complete elimination of persistent chemicals can be expected. "Maintenance of ecological integrity" will be a never-ending task requiring adaptation to new circumstances as experience and knowledge are gained.

Behavioral Effectiveness

Another measure of the effectiveness of an international regime is whether its operation affects the behavior of the parties themselves or of others under their jurisdiction, such as nongovernmental citizen organizations, industry, and members of the general public. Changes may include doing some things they would not otherwise have done or not doing other things. A complication in applying this criterion is that it is not always possible to link a behavioral change to the operation of the regime even when the change is clearly related to its objectives.

All three kinds of behavioral changes have occurred under the GLWQA, which continues to set the agenda for many environmental organizations, to determine research agendas for both government and nongovernmental institutions, and to involve industry in regulatory and policy debate. The Great Lakes experience has influenced the development of national environmental policy first in the acceptance of a binational cleanup effort and second in actions by the Canadian ministries and U.S. executive departments and in the Parliament and Congress.

The Great Lakes Charter (on diversion) signed by all eight governors in 1985 reflects the indirect influence of binational experience under the GLWQA and acceptance of the Agreement's contention that the Great Lakes must be managed as a unified system. The Agreement's influence was more direct in the subsequent Toxics Substance Control Agreement and in the fact that both agreements involved consultation between the states and provinces. More recently, many entities have demonstrated their continuing commitment by signing the Ecosystem Charter developed by the Great Lakes Commission, even though it has no management authority.

Process Effectiveness

Regime effectiveness can also be measured by "the extent to which the provisions of the international regime are implemented in the domestic legal and political systems of the member states as well as the extent to which those subject to a regime's prescription actually comply with the requirements." Both countries have created institutions and programs to meet obligations of the Agreement and have recognized its requirements in their water laws and programs.

Government actions have been supplemented by the development of formal coalitions and informal networks that include the Council of Great Lakes Industries, Great Lakes United, the Great Lakes Ecosystem Charter, and the International Association of Great Lakes Research, and the inclusion of the provinces in activities of the Council of Great Lakes Governors and the Great Lakes Commission. These and many other agencies, institutions, and organizations participate in the binational process managed by the IJC and interact with each other in a broad binational community because of the GLWQA.

Constitutive Effectiveness

This criterion considers that regime may be effective if "its formation gives rise to a social practice involving expenditure of time, energy, and resources on the part of its members." Parties may spend resources in a regime even if they do not like its aims or requirements or if the goals that inspired it are never attained.

Funding for the IJC seems to have remained fairly constant over the years, with inflation causing a marginal annual decline. Throughout its history, the Agreement has been cited in both countries as the justification for providing resources to implement policies and programs. There is no evidence that expenditures for Great Lakes programs will be reduced any more than for other programs in the current general reduction of government expenditures on both sides.

Evaluative Effectiveness

Young's final measure of effectiveness is whether the regime produces results that are "efficient, equitable, sustainable, or robust." The issue is not simply whether results flow from the regime but whether comparable or superior results could have been achieved at lower cost and whether benefits are distributed fairly.

"Robustness" considers the vigor of results and their capacity to survive changing political or economic conditions. The finding that the Great Lakes regime is effective under this criterion is supported by the factors considered in the analysis above of features of the Agreement that account for its effectiveness.

The development of the Agreement coincided with the explosive expansion of environmental activism in both countries. Its implementation processes provided a forum for interaction between scientists and environmentalists and government officials. Great Lakes issues provided an organizing tool for existing and new environmental organizations in both countries, who joined a region-wide, binational network in Great Lakes United.

This unified community then worked to stimulate the political will for the governments to acknowledge their obligations under the Agreement.

The research base of the GLWQA has also enhanced the robustness of the Agreement and the strength of its processes and extended its influence far beyond the Great Lakes basin. The binational environmental community has remained strong despite the withdrawal of the parties from the processes of the IJC since the 1987 Protocol and despite organizational struggles with declining funding and changes of leadership.

The robustness of the RAP process varies, but throughout the basin local government officials are interacting with industry representatives and citizens on behalf of Agreement objectives. In some locations, the interaction is leading to new attention to such issues as sustainability and to more consideration of relationships between environmental protection and economic development.

The central question for the future of the Great Lakes regime is whether the processes of the Water Quality Agreement will continue to nurture the community that has been so essential to its vigor in its first quarter of a century. Its future is more uncertain now than at any time since the Agreement was signed in 1972.

PART 5: THE UNCERTAIN FUTURE OF THE GREAT LAKES REGIME

Factors that create uncertainty come from inside and outside the Great Lakes regime. External factors include a new political context in which government expenditures are decreasing in both countries, new biological and physical threats to the lakes themselves, and uncertain relations with other international agencies with overlapping agendas. Internal factors include changes in the operations of the IJC and in the relationships between the IJC and the lead agencies for the parties. The Great Lakes community overall seems less able to agree on common goals than in the past.

As new scientific evidence confirms the potential threat to human health by chemicals that affect hormonal systems, toxic contamination continues as the major current water quality issue. Industry opposes the regulatory approach for persistent bioaccumulative substances proposed by the governments.[611] Loss of habitat is recognized as being due to land use as well as pollution but neither country has yet successfully controlled pollution from nonpoint sources.[612] New questions are being raised about an appropriate balance of phosphorus inputs to maintain the productivity of the fishery.[613] The fishery continues to decline as exotic species compete with native species and affect water quality in ways that some scientists expect to cause more profound change in the aquatic ecosystem than has occurred from any other cause.[614]

In spite of great progress during the first two decades, compliance with environmental laws and regulations within the basin is not only incomplete but will be a never-ending struggle. Although reversing eutrophication is the greatest success to date under the Great Lakes Agreement, the 1996 SOLEC working paper on nearshore waters said that "Human sewage effluent in the lakes will be a management issue for the foreseeable future" because of population growth and the need to control combined sewer overflows in cities.[615]

The political power of the Great Lakes community has been reduced in the 1990s as environmental groups in both countries struggle with organizational issues and the general public has less understanding of today's complex environmental issues. Jane Elder, director of the Sierra Club Great Lakes Program and a leader in legislative and lobbying activities in the 1980s, thinks that mistrust of government is another factor in lower participation in efforts to affect policies in the 1990s. She says that research shows a link between a decline in political activism among young adult members of the Sierra Club and a lack of belief in government's capacity to solve social problems.[616]

Now the IJC and the Great Lakes Agreement must compete for activist attention with the new trilateral Commission for Environmental Coordination and other emerging international forums on such global issues as climate change. For ontinuing future

progress, all of these new circumstances must be confronted by the community that is most responsible for past successes.[617]

5.1 External Influences

External factors that may affect the future of the Great Lakes regime include political trends that may undermine the commitment of the governments to the agreement. In its Eighth Biennial Report, the IJC urged that government efforts to reduce regulatory burdens and spending "should not be allowed to . . . compromise the ability of Canada and the United States to meet their Agreement commitments."[618] In both countries, reductions in federal funding for environmental cprograms are related to struggles over weakening of federal environmental laws and relinquishment of responsibility for environmental protection to state and provincial governments. In earlier periods, conservative political trends that resulted in decreased fiscal resources and attention to Great Lakes priorities was in part countered by strong public involvement.

In the U.S., reductions for environmental programs in general may not be as great as first proposed in Congress in 1995--96 because public protests made environmental protection a major issue in the 1996 presidential election.[619] Still, diminished attention to agreement processes by environmental organizations in the mid-1990s means that less effort is being made on behalf of the Great Lakes. The trend toward a "new federalism" that began in the 1980s is reflected in how the USEPA began deferring more to the states for implementation and enforcement of environmental laws in the mid-1990s. Funding reductions are also threatening research programs.[620]

In Canada, issues of national unity and weakness of the economy continue to distract from other issues. The recent 30 percent and greater recent reductions for both federal and provincial agencies may continue and federal commitment to environmental protection remains a point of controversy in proposed revisions to the Canadian Environmental Protection Act at the end of 1996. Meanwhile, the Ontario provincial government is carrying out its most ambitious regulatory reform and downsizing of programs in history.

Such changes on both sides of the border make continuation uncertain for the regionalism reflected in many basin-wide Great Lakes institutions.[621] Meanwhile, there is doubt about the role of environmental organizations, many of which are struggling with the maintenance of funding and leadership. With challenges typical for environmental groups in this period, the binational Great Lakes United had three changes in executive directors between 1994 and 1996. In the 1990s no single issue has united the Great Lakes community under GLU leadership across the border as the opposition to diversion of Great Lakes water and toxic contamination did in the 1980s.

In Canada, some environmental groups, such as Pollution Probe, are spending much less energy on Great Lakes issues than a decade ago. Other groups remain active on Great Lakes issues but have their attention continually drawn to other issues such as deregulation and trade.

In the U.S., major Great Lakes environmental leaders of the 1980s have moved on to new national positions.[622] Many environmental organizations are having difficulty sustaining adequate funding, with major staff turnovers. In 1996 the board of directors of the Charles Stewart Mott and other foundations were considering whether to continue the support that had been essential to expanding the capacity of the regime in the 1980s.

Another external uncertainty that could affect the regime was the establishment of the Commission for Environmental Cooperation for North America without any consideration of a role for the IJC.[623] Overlapping issues that concern both agencies include toxic contamination, pollution prevention and air quality, including pesticide use in Mexico that is a continuing pollution source for the Great Lakes through long-range transport. Even though the CEC uses Great Lakes experience and information in dealing with toxic contamination, to date there has been no formal coordination between the two agencies.

5.2 Issues for the Future Within the Regime

As discussed in Part 4, Chapter 4, in the first half of the 1990s, diminished interaction between the IJC and the lead agencies and confusion about the roles and mandates of the advisory boards seem to have weakened the binational process that has been a major strength of the regime. Some scientists, government agency personnel, IJC staff, and environmentalists have expressed doubts about whether the emerging new institutions of the parties such as the BEC and SOLEC will undermine the interaction that was an earlier strength of the regime.[624] Scientists and others are concerned about the future of the research programs because of funding cuts that interfere not only with current activities but the education of future researchers.[625]

Another question is whether the interests of the IJC and the lead agencies aree diverging. The concentration on toxic contamination and human health issues in the IJC's Seventh Biennial Report and the 1995 meeting in Duluth contrasted with the much broader agenda of the first SOLEC meeting in 1994. Moreover, only about 350 persons, mostly agency personnel, attended the 1994 SOLEC. The IJC announcement in the summer of 1996 that it would not hold its traditional public meeting in 1997 raised additional questions about how the information exchange that had previously helped bring the broader community together would be continued.

Yet in 1996 there were also signs that cohesion remains within the regime. At the end of July, the BEC decided to open its meetings to outside observers. Environment Canada and the USEPA were consulting with environmental and other interests about their draft Binational Virtual Elimination Strategy for toxic contamination. After talking with industry representatives and environmentalists in early autumn, the IJC reconsidered and scheduled a public meeting in 1997 and also decided to continue to broaden other means of consultation.[626] Attendance doubled at the 1996 SOLEC in November, with broader representation of diverse interests.

Still, questions remain about whether various constituencies within the regime will continue to work together with the intensity that led to past successes in solving Great Lakes problems. Some environmental organizations, with the IJC, continue to focus their attention on toxic contamination and the virtual elimination goal of the Agreement. Others concentrate attention, with USEPA and Environment Canada, on habitat restoration and other biodiversity issues. While scientists share the Fishery Commission's concerns about the threats from new invasions of exotic species but the Commission continues to work mainly with fishery management agencies and the commercial and sport fishing industries rather than the rest of the regime.

5.3 Overriding Questions for the Future of the Great Lakes Agreement

Two major questions confront the Great Lakes community for the future of the Great Lakes Agreement. First, how can the community come together to give priority to restoration and protection of the Great Lakes ecosystem? Second, will the integrity of the Great Lakes Agreement be maintained in the review by the governments that is scheduled to occur in 1999? Given the finding of this review of that successes under the Agreement have depended on the community that has participated in its implementation to date, the answers to these questions seem to depend on the ability of the community to maintain its strength in the future.

PART 6: RECOMMENDATIONS TO THE GREAT LAKES REGIME, TO THE IJC, AND TO THE PARTIES

The history and the evolution of the Great Lakes Water Quality Agreement are rich and dynamic, but its future is uncertain. Although the Agreement has contributed to the improvement of water quality, its effectiveness for the larger goal of protection of the Great

Lakes ecosystem depends most upon the continued vitality of the broad and diverse community that it fosters.

The strength of the community is derived from the binationalism and equality and parity that have characterized the Agreement's institutions as well as its common fact-finding approach to problems and issues. The effectiveness of the Agreement also derives from its built-in flexibility and required accountability.

If these attributes are important to the effectiveness of the regime, the logical question is how they can be enhanced and furthered by the review that is dues in 1999. Past experience shows that the fundamental terms of the present agreement do not need to be altered for adaptation to new circumstances. Thus the recommendations offered here chiefly highlight the nature and direction of changes needed to maintain a strong Great Lakes community and improve the operation of the regime.

6.1 Maintaining a Strong Agreement

Recommendation 1: No change should be made in the Great Lakes Water Quality Agreement except to enhance its operations and progress toward its present goals.

The effectiveness of the Agreement as it stands has already been demonstrated against eutrophication and toxic contamination. Its flexibility and the goal of an ecosystem approach to management will allow new problems to be addressed, such as preservation of habitat and biodiversity, provided operational changes are made to enhance coordination and communication.

6.2 Supporting Common Goals

Recommendation 2: The goals of institutions of the regime must be consistent with the goals of the Great Lakes Water Quality Agreement and their programs must reflect these goals.

Shared commitment to the goals of the Agreement are the foundation for the sense of community which in turn has been essential to its success. The commitment must be renewed in the 1990s because of signs that it may have declined in parts of the community.

6.3 Maintaining a Strong Great Lakes Community

Recommendation 3: Those jurisdictions, institutions and persons who believe in the goals of the Great Lakes Agreement must consciously work together to maintain and expand the sense of community on which its continuing progress depends.

The strength of the Great Lakes community depends on contributions from all its members and on their willingness to work together for the goals they have accepted in supporting the Great Lakes Agreement. In recent years, appreciation seems to have diminished for the value and contributions by different parts of the community for each other.

6.4 Serving the Information Needs of the IJC

Recommendation 4: The IJC should clearly describe to the parties the information it needs in order to assess the effectiveness of government programs.

Since the lead agencies for the parties, Environment Canada and the U.S. Environmental Protection Agency, began to work together directly rather than through the IJC following the 1987 Protocol, the IJC has less knowledge about how the governments are addressing issues and problems. The IJC can help improve the situation by telling the governments exactly what information it needs in order to fulfill its responsibility for assessing the effectiveness of programs.

6.5 Response by the Parties to the Information Needs of the IJC

Recommendation 5: Environment Canada and the U.S. Environmental Protection Agency should design the SOLEC and other joint processes to provide information needed by the IJC to assess progress and the effectiveness of programs.

Formerly, the governments provided information to the IJC through the Water Quality Board. Since this is no longer happening, the lead agencies should make certain that their new State of the Lakes Conferences provide information that the IJC needs.

6.6 Maintaining the Binational Character of the Regime

Recommendation 6: In order to maintain one of the strengths of the regime, the lead agencies must maintain the spirit of binationalism in their direct actions with each other. Within its own operations, the IJC must also ensure its binationalism and its independent ability to collect, analyze and verify information and data with a joint institution such as the Water Quality Board.

This recommendation is needed because the separate activities of the lead agencies and the IJC and the resulting decreased communication and exchange of information have undermined the binationalism that has been one of the regime's greatest strengths.

6.7 Furthering Accountability

Recommendation 7: In addition to providing the data and information needed to satisfy the requirements for consultation and review in Article 10 of the Agreement, Environment Canada and USEPA and the states and provinces should inform the IJC and the public how they will coordinate their work plans to make further progress toward the goals of the Agreement.

The openness that assisted nongovernmental participation in the Great Lakes Community in the past depends on information about how the governments intend to address problems. The 1997 Protocol specifically stated that the agencies should coordinate their workplans in working for common purposes but the public has not, for example, been informed whether such coordination is planned for the Binational Virtual Elimination Strategy.

6.8 Maintaining Equality and Parity

Recommendation 8: The parties should consider how to maintain parity and equality in their operations and institutions in light of evolution in the relationships between the federal governments, the provinces and states, and tribal and First Nation/aboriginal constituencies. Within its own operations, the IJC should also seek to further the principles of equity and parity in a similar manner.

It is not clear how the parity and equality between the parties can be maintained as the federal governments on both sides turn over of responsibility for environmental programs to the states and provinces nor how it will be handled as tribal councils and First Nations are given more autonomy nor how these changes will affect operations of the IJC. This recommendation urges attention to the consequences of the current trends toward decentralization of authority in both countries.

6.9 Maintaining Flexibility

Recommendation 9: The flexibility essential to the continuing evolution of Agreement processes must be maintained. Flexibility requires that the IJC ensure that its processes can be sufficiently responsive to identify new and emerging issues in the Great Lakes. Specifically, the IJC should provide discretionary resources to the Science Advisory Board and use of the Water Quality Board for program coordination as well as policy debate.

Flexibility in sources of information has been diminished since the IJC is setting the agenda for the two advisory boards. Without resources of its own, the Science Advisory Board can no longer initiate attention to new and emerging issues as it did in the past. Neither does the Water Quality Board provide a forum for program coordination between government agencies or initiate policy debate as it did formerly.

6.10 Assuring Nongovernmental Participation and Oversight

Recommendation 10: The IJC should create a forum for debate and greater participation by representatives of nongovernmental interests in the regime, in a Citizens Advisory Board.

Although nongovermental participation is essential in the democratic systems of both countries that are parties to the Agreement, the lack of other opportunities has been a factor in the character of recent IJC meetings to which some have objected. Provision of a formal mechanism for nongovernmental input would strengthen the community committed to the goals of the Great Lakes Agreement.

6.11 Providing Continuity at the IJC

Recommendation 11: The governments should stagger appointments to the IJC in order to assure continuity, stability and leadership by commissioners.

The conduct of IJC business has been delayed by gaps in IJC membership and the time required for new commissioners to learn the issues and processes. Lack of continuity also

increases dependence of new commissioners on staff for guidance. Both problems could be solved by staggering appointments.

6.12 Clarifying IJC Relationships with Other International Institutions

Recommendation 12: The IJC should seek clarification of its relationships with the Great Lakes Fishery Commission and the CEC, and should consider taking a more active role in relevant international forums outside the Great Lakes basin.

An ecosystem approach to management requires that the functions of the IJC be coordinated with those of other agencies that deal with matters of mutual concern. The need for coordination between the IJC and the Fishery Commission has grown with the problem of invasion of exotic species and the new concerns about the importance of habitat preservation. In the case of the CEC, such coordination could be the means to address the problem of long range transport of toxic contaminants into the Great Lakes from outside the basin.

NOTES

[1] Lee Botts and Bruce Krushelnicki, *The Great Lakes: An Environmental Atlas and Resource Book* (Ottawa and Washington, D.C.: Environment Canada and U.S. Environmental Protection Agency, 1988).

[2] David R. Allardice and Steve Thorp, *A Changing Great Lakes Economy: Economic and Environmental Linkages*, Background Paper for the State of the Lakes Ecosystem Conference, Environment Canada and U.S. Environmental Protection Agency (Dearborn, Michigan: August 1995), EPA 905-R-95-017.

[3] Great Lakes Water Quality Agreement, signed April 14, 1972. International Joint Commission, Ottawa and Washington, D.C., hereinafter referred to as the 1972 Agreement.

[4] A Treaty between the United Kingdom and the United States of America relating to Boundary Waters, and Questions arising between the United States and Canada, now known as the Boundary Waters Treaty of 1909, International Joint Commission, Ottawa and Washington, D.C. The U.K. retained the power to sign international treaties on behalf of Canada.

[5] Revised Great Lakes Water Quality Agreement of 1978, with Annexes and Terms of Reference, signed November 22, 1978, International Joint Commission, Ottawa and Washington, D.C., hereinafter referred to as the 1978 Agreement.

[6] The 1978 Great Lakes Water Quality Agreement, Article 10, provides that, "The Parties shall conduct a comprehensive review of the operation and effectiveness of this Agreement following every third biennial report of the Commission required under Article 7 of this Agreement." In 1993, the Parties agreed not to carry out a comprehensive review.

[7] Oran R. Young, *International Governance: Protecting the Environment in a Stateless Society* (Ithaca, New York and London: Cornell University Press, 1994), pp. 204–206.

[8] Ibid., pp. 3–4.

[9] Ibid.

[10] N.F. Dreiziger, "Dreams and Disappointments," in *The International Joint Commission Seventy Years On*, ed. Robert Spencer, John Kirton, and Kim Richard Nossal (Toronto: Centre for International Studies, University of Toronto, 1981).

[11] John W. Holmes, Introduction in Spencer, Kirton, and Nossal, *Seventy Years On*, p. 6.

[12] William R. Willoughby, "Expectations and Experience 1909–1979," in Spencer, Kirton, and Nossal, *Seventy Years On*, pp. 24–42.

[13] See generally Maxwell Cohen, "The Regime of Boundary Waters: the Canadian-U.S. Experience," *Recueil des Cours* 146 (1975).

[14] Former Canadian IJC Chair Maxwell Cohen, as quoted in *The Standing Senate Committee on Foreign Affairs, Canada-United States Relations, Volume 1: The Institutional Framework for the Relationship* (Ottawa: Queen's Printer, 1975), p. 41.

[15] Appendix 3, "IJC References and Applications, 1912–1977," in Spencer, Kirton and Nossal, *Seventy Years On*, pp. 142–151.

[16] International Joint Commission of Canada and the United States, *Pollution of Lake Erie, Lake Ontario and the International Portion of the St. Lawrence River* (Ottawa and Washington, D.C.: IJC, 1970).

[17] Maxwell Cohen, "The Commission from the Inside," in Spencer, Kirton, and Nossal, *Seventy Years On*, pp.106-123.

[18] International Joint Commission, Levels Reference Study Board, *Levels Reference Study: The Great Lakes and St. Lawrence River Basin,* Report submitted to the IJC (Washington and Ottawa: March, 1993). The study board recommended that "the governments give no further consideration to five-lakes regulation" (p. 39), and instead, that "prevention and land use management measures . . . be applied" (p. 61).

[19] C.B. Bourne, "Canada and the Law of International Drainage Basins," in *Canadian Perspectives on International Law and Organization*, ed. R. St. J. MacDonald, Gerald L. Morris, and Douglas M. Johnston (Toronto: University of Toronto Press, 1974), p. 488.

[20] Traditionally, the IJC has depended on two categories of technical advisory boards for recommendations and advice. One category includes standing Control Boards for transboundary waterways where levels are regulated and where IJC approval is needed for construction of engineering works. The second category includes special Investigative Boards established when references, or requests, are received from the governments for advice on a specific issue. The IJC is empowered to recruit equal numbers of experts from each side to serve on these boards, usually from government agencies. As discussed in the text, this concept was expanded in the Great Lakes agreement.

[21] Members of the Science Advisory Board as well as work groups, task forces, and subcommittees have included members of environmental organizations, representatives of industry, academic experts, and other private citizens.

[22] Maxwell Cohen, in Canada, Senate Committee on Foreign Affairs, Minutes of Proceedings, February 18, 1979, p. 6, cited in William R. Willoughby, "Expectations and Experience: 1909–1979." Also, Cohen, "The Regime of Boundary Waters: The Canadian-U.S. Experience," 1976.

[23] International Joint Commission of United States and Canada, *Rules of Procedure and Text of Treaty* (Ottawa, Canada and Washington, D.C.: IJC, 1965), Part I, p. 8.

[24] International Joint Commission, *An Annotated Digest of Materials Relating to the Establishment and Development of the International Joint Commission* Prepared for the Canadian Section (Ottawa: IJC, 1967).

[25] Charles Ross, "Water Pollution Control under the Boundary Waters Treaty of 1909" (Presented to the International Association for Great Lakes Research, May 19, 1980).

[26] Ibid.

[27] Jean Hennessey interview.

[28] John E. Carroll, "Patterns Old and New," in Spencer, Kirton, and Nossal, *Seventy Years On,* p. 48.

[29] Standing Senate Committee on Foreign Affairs, "Canada-United States Relations: The Institutional Framework for the Relationship" (Ottawa: Canadian Senate, December 1975), p. 42.

[30] David LeMarquand and Anthony Scott, "Canada's Environment Relations," in O.P. Dwivedi (ed.) *Resources and the Environment: Perspectives for Canada* (Toronto: McLelland and Stewart, 1980), p. 87.

[31] Text of identical letters sent by the Secretary of State for External Affairs, Canada, and Secretary of State, United States, for their respective governments to the respective secretariat offices of the International Joint Commission, October 7, 1964, in International

Joint Commission of Canada and the United States, *Pollution of Lake Erie, Lake Ontario and the International Section of the St. Lawrence River*, Appendix, 1970.

[32] Ibid., p. 2.

[33] Don Munton, "Great Lakes Water Quality: A Study in Environmental Politics and Diplomacy," in *Resources and Environment*, pp. 169–171.

[34] International Great Lakes Levels Board, International Joint Commission, *Regulation of Great Lakes Water Levels* (Report to the International Joint Commission, 1973).

[35] R.A. Vollenweider, *The Scientific Basis of Lake and Stream Eutrophication with Particular Reference to Phosphorus and Nitrogen as Factors in Eutrophication*, DAS/CSI/67-27 (Paris, France: Organization for Economic Cooperation and Development, 1968); A.M. Beeton, "Eutrophication of the St. Lawrence Lakes," *Limnology and Oceanography* 10 (1965): 240–254.

[36] Paul Bertram, "Reversing Eutrophication in Lake Erie, Management, Monitoring and Money" (Presentation to the 25th International Congress of the Societas Internationalis Limnologae [International Society of Limnologists], Barcelona, Spain, August 21, 1992).

[37] Joseph DePinto and Thomas C. Young, "Great Lakes Water Quality Improvement," *Environmental Science and Technology* 20, no. 8 (1986).

[38] Peter J. Colby, "Alewife Dieoffs: Why Do They Occur?" *Limnos, The Magazine of the Great Lakes Foundation* 4, no. 2 (Summer 1971): 18–27.

[39] International Joint Commission of Canada and the United States, *Pollution of Lake Erie, Lake Ontario, and the International Sections of the St. Lawrence River,* 1970.

[40] International Joint Commission, *First Annual Report* (IJC, 1974).

[41] Botts and Krushelnicki, *The Great Lakes.*

[42] See Docket 95, in the *Bibliography of Reports* (Washington, Ottawa, Windsor: International Joint Commission February, 1996), pp. 21–28.

[43] Ibid, Docket 94, pp. 20–21.

[44] Great Lakes Water Quality Agreement of 1972, Article 6, no. 3. Also, Terms of Reference for the Joint Institutions and the Great Lakes Regional Office, 3(b)(ii).

[45] Quoted in Jack Manno, "The Emerging Great Lakes Community and the Earth Summit: Some Thoughts Inspired by the Consortium Conference," Report of the Great Lakes Research Consortium, *SUNY College of Environmental Science and Forestry* 5, no. 1 (Spring 1992): 1.

[46] The dependence of the IJC on voluntary actions by the governments is extensively considered in the literature. One source that compares the powers of the IJC with those of other Great Lakes institutions is Michael Donahue, "Institutional Arrangements for Great Lakes Management: Past Practices and Future Alternatives" (Doctoral Dissertation, University of Michigan, 1986).

[47] Jack Manno, "Advocacy and Diplomacy: NGOs and the Great Lakes Water Quality Agreement," in *Environmental NGOs in World Politics: Linking the Local and the Global*, Thomas Princen and Matthias Finger, eds. (London and New York: Routledge, 1994), pp. 99–105.

[48] Great Lakes Water Quality Agreement of 1972, Article 10.

[49] National Research Council of the United States and the Royal Society of Canada (NRC/RSC), *The Great Lakes Water Quality Agreement: An Evolving Instrument for Ecosystem Management* (Washington, D.C.: National Academy Press, 1985), pp. 10–13.

[50] In 1979 and 1980, Richard Robbins, Executive Director of the Lake Michigan Federation, objected to the membership of Dr. Mitchell R. Zavon, Hooker Chemical Medical Director, on the Science Advisory Board, because of the growing controversy over the company's operations near Niagara Falls. (Correspondence in Lee Botts collection, Calumet Archives, Indiana University Northwest).

[51] David LaRoche interview.

[52] Glenda Daniel, "The Great Lakes Water Quality Agreement: A State Perspective" (Prepared for the Great Lakes Governance Project of Dartmouth College, December 1995).

[53] The Third Biennial Report was delayed until 1986, when a fourth report should have been due.

[54] Lee Botts, personal observation.

[55] Great Lakes United, *Unfulfilled Promises: A Citizen's Review of the International Great Lakes Water Quality Agreement* (Buffalo, N.Y.: GLU, February 1987), p. 10; Revised Great Lakes Water Quality Agreement of 1978, As Amended by Protocol Signed November 18, 1987, Article 10, p. 3.

[56] Great Lakes Water Quality Agreement of 1972, Article 7.

[57] Interview with Regional Office staff, September 16, 1994.

[58] Hilary Cleveland interview.

[59] "Comeback for the Great Lakes," *Time Magazine,* December 3, 1979; Dean Rotbart, "Lake Erie Is Cleaner These Days, or Is It? Some Say the Troubles Have Just Started," *Wall Street Journal,* September 3, 1980.

[60] Science Advisory Board, International Joint Commission, *A Perspective on the Problem of Hazardous Substances in the Great Lakes Basin Ecosystem*, Science Advisory Board Annual Report to the IJC (Windsor, Ontario: IJC, November 13, 1980).

[61] Thomas Heidtke, William Sonzogni, and Lee Botts, *Great Lakes Environmental Planning Study: Summary Report* (Ann Arbor, Michigan: Great Lakes Basin Commission, 1981).

[62] Paul Bertram, M. Neilson, S. L'Italien, V. Glumac, and D. Williams, "Nutrients: Trends and System Response." Background paper for State of the Lakes Ecosystem Conference, Environment Canada and the U.S. Environmental Protection Agency (Windsor, Ontario: November 1995).

[63] DePinto and Thomas, "Great Lakes Water Quality Improvement."

[64] Alfred Beeton, personal communication to Lee Botts.

[65] Lee Botts, "Toxics from Heaven," *Citizens for a Better Environment Environmental Review* (Chicago, Illinois: August–September 1984).

[66] R. Frank, H.E. Braun, M.U.H. Holdrinet, D.P. Dodge, and S.J. Nepszy, "Residues of organochlorine insecticides and polychlorinated biphenyls in fish from Lakes St. Clair and Erie, Canada, 1968–1976," *Pesticides Monitoring Journal* 12 (1978) 69–80.

[67] International Reference Group on Great Lakes Pollution from Land Use Activities, *Environmental Management Strategy for the Great Lakes System*, Final Report to the

International Joint Commission (International Joint Commission (Windsor, Ontario: July 1978), pp. 4–5.

[68] T.J. Murphy and Rzeszutko, "Precipitation Inputs of PCBs to Lake Michigan," *Journal of Great Lakes Research* 3 (1977): 305–312; W.R. Swain, "Chlorinated Organic Residues in Fish, Water, and Precipitation from the Vicinity of Isle Royale, Lake Superior," *Journal of Great Lakes Research* 4 (1978): 398–407.

[69] Alfred Beeton interview.

[70] David LaRoche and Valdas Adamkus interviews.

[71] Robert Slater, George Alexander, and Peter Wise interviews.

[72] Robert Slater and Valdas Adamkus interviews.

[73] Confidential interviews.

[74] What is now known as the U.S. Clean Water Act was first passed in 1972 as P.L. 92-500 or Amendments to the Federal Water Pollution Control Act. After reauthorization with amendments in 1977, it became known as the Clean Water Act. Further amendments were made in 1987 and 1990 (33 U.S.C. Section 1251-1987).

[75] Valdas Adamkus interview.

[76] Conrad Kleveno and Valdas Adamkus interviews.

[77] Kent Fuller interview.

[78] The following reports related to the Great Lakes have been submitted to Congress by the U.S. General Accounting Office:

1975 *Cleaning Up the Great Lakes: United States and Canada Are Making Progress in Controlling Pollution from Cities and Towns* (RED-75-338);

1978 *How the United States Can and Should Improve Its Funding of International Joint Commission Activities* (ID-78-10);

1982 *A More Comprehensive Approach Is Needed to Clean Up the Great Lakes* (CED-82-63);

1982 *International Joint Commission Water Quality Activities Need Greater U.S. Government Support and Involvement,* Report to the Secretary of State (CED-82-97);

1989 *State Department: Need to Reassess U.S. Participation in the International Joint Commission* (GAO/NSIAD-89-164);

1990 *Water Pollution: Improved Coordination Needed to Clean Up the Great Lakes* (GAO/RCED-90-197);

1991 *Water Pollution: Observations on EPA's Efforts to Clean Up the Great Lakes,* Testimony before the Subcommittee on Oversight of Government Management, Committee on Governmental Affairs, United States Senate (GAO/T-RCED-92-1);

1992 *Water Resources: Future Needs for Confining Contaminated Sediment in the Great Lakes Region* (GAO/RCED-92-89);

1994 *Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach* (GAO/RCED-94-111).

[79] Conrad Kleveno, Peter Wise, and Peter Christich interviews.

[80] Conrad Kleveno interview.

[81] Valdas Adamkus interview.

[82] George Alexander interview.

[83] Clean Water Act, Section 101 (a) (1).

[84] Section 105 of the Clean Water Act provides for research grants and demonstration grants for improved waste treatment, etc., to state and local governments. Section 106 provides grants to assist the states with the pollution control programs required by the federal law.

[85] Valdas Adamkus interview.

[86] Fitzhugh Green speech, in Lee Botts collection, Calumet Archives, Indiana University Northwest.

[87] Conrad Kleveno interview.

[88] Municipal Abatement Task Force of the Water Quality Programs Committee, *A Review of the Municipal Pollution Abatement Programs in the Great Lakes Basin*, Report to the Great Lakes Water Quality Board (Windsor, Ontario: International Joint Commission, November 1983), p. 57.

[89] Peter Wise interview.

[90] Kent Fuller interview. See also U.S. Environmental Protection Agency, Office of Great Lakes National Programs, *Voluntary and Regulatory Approaches for Nonpoint Source Control: Proceedings of a Conference, 22–28 May 1978* (Chicago, Illinois: USEPA, July 1978), EPA/9-78-001.

[91] Rose Ann Sullivan, Paul A. Sanders, and William Sonzogni, *Post-PLUARG Evaluation of Great Lakes Water Quality Management Studies and Programs*, Report of the Great Lakes Basin Commission for the USEPA (Ann Arbor: Great Lakes Basin Commission, September 1980), EPA 905/9-80-006-A.

[92] Don Munton interview.

[93] Rich Thomas interview.

[94] Daniel, "The Great Lakes Water Quality Agreement."

[95] Lee Botts, personal observation.

[96] Kent Fuller interview.

[97] Lyman Wible interview.

[98] The "winter navigation project" was an Army Corps of Engineers study of the feasibility of maintaining year round navigation by such means as breaking ice in connecting channels between the lakes and use of various means of preventing ice formation in harbors.

[99] Lee Botts, personal observation. See also Princen and Finger, *Environmental NGOs in World Politics*: Manno, "The Emerging Great Lakes Community," pp. 84–86.

[100] John Jackson, "The Provinces and the Great Lakes Water Quality Agreement" (Report prepared for the Great Lakes Governance Project of Dartmouth College, December 1995).

[101] Robert Slater interview.

[102] See Purpose Section, Canada-Ontario Agreement, signed July 12, 1982.

[103] Don Munton interview.

[104] Don Mount interview.

[105] Alfred Beeton interview.

[106] Ibid.

[107] Rich Thomas interview.

[108] Leonard Dworsky and George Francis, "A Proposal for Improving the Management of the Great Lakes of the United States and Canada" (Presented at the 1971–1972 Canada-U.S. University Seminar, (Washington, D.C., Office of Water Resources Research, United States Department of Interior: January 1973).

[109] Ibid.

[110] Leonard Dworsky and George Francis, "The 1973 Floods and Activities of the International Joint Commission, United States and Canada," *Testimony to the Hearings before the Subcommittee on Foreign Affairs*, Part I, U.S. House of Representatives, May 1, 1973, p. 113.

[111] Standing Committee on Foreign Affairs, *Canada--United States Relations: The Institutional Framework for the Relationship*, Committee Print no. 10 (Washington, D.C.: U.S. House of Representatives, 1975).

[112] Leonard B. Dworsky, Albert E. Utton, and David J. Allee, "The Great Lakes: Transboundary Issues for the Mid-90s," *University of Toledo Law Journal* 26 (Winter 1995): 347–386.

[113] Water Resources Planning Act, P.L. 89-80, 89th Congress, July 22, 1965.

[114] Lee Botts, personal observation.

[115] Lee Botts, personal observation.

[116] Great Lakes Basin Commission, Fisheries and Environment Canada and Army Corps of Engineers, North Central Division, *The Role of Vegetation in Shoreline Management: A Guide for Great Lakes Shoreline Property Owners* (Ann Arbor, Michigan: Great Lakes Basin Commission, 1980).

[117] Donahue, "Institutional Arrangements for Great Lakes Management," pp. 105–107.

[118] Great Lakes Fishery Commission, *A Joint Strategic Plan for Management of Great Lakes Fisheries* (Ann Arbor, Michigan: Great Lakes Fishery Commission, December 1980).

[119] Great Lakes Water Quality Agreement of 1972, Article 8, no. 3.

[120] Ibid., no. 4.

[121] International Joint Commission, Terms of Reference for the Joint Institutions and the Great Lakes Regional Office, Great Lakes Water Quality Agreement of 1978, with annexes and terms of reference between the United States of America and Canada, signed at Ottawa, November 22, 1978.

[122] "Report on the Regional Office of the International Joint Commission, A Joint Canada/United States Study Group," Internal Review Paper, International Joint Commission, 1979, p. 1.

[123] Ibid.

[124] Carol Y. Swinehart gave a detailed account of the activities of the Great Lakes Regional Office on public participation in an unpublished paper entitled "Public Information and

Participation Activities under the Great Lakes Water Quality Agreement of 1978: A Review," while she held the position of Communicator for the Marine Advisory Service of the Michigan Sea Grant College Program, Lansing, Michigan, 1980. A copy is in the Lee Botts Collection, Calumet Archives, Indiana University Northwest.

[125] IJC Report on the Regional Office, 1979.

[126] Ibid., p. 13.

[127] Ibid., p. 15

[128] The 1972 Great Lakes Water Quality Agreement, Terms of Reference for the Establishment of a Research Advisory Board, p. 5.

[129] Research Advisory Board, Standing Committee on Social Sciences, Economic and Legal Aspects, *Proceedings of a Workshop on Public Participation* in Ann Arbor, Michigan, June 23–24, 1975 (Windsor, Ontario: IJC, 1975).

[130] IJC Report on the Regional Office, 1979.

[131] Conrad Kleveno interview.

[132] Great Lakes Water Quality Board, International Joint Commission, *Great Lakes Water Quality 1974*, Third Annual Report to the International Joint Commission (Windsor, Ontario: IJC, July 1975), p. 126.

[133] Ibid.

[134] The history of concern about this issue is discussed in NRC/RSC, *The Great Lakes Water Quality Agreement,* pp. 87–88.

[135] Peter Wise interview.

[136] Great Lakes Water Quality Board, *Great Lakes Water Quality 1974*, pp. 128–129.

[137] International Joint Commission, *Third Annual Report: Great Lakes Water Quality 1974* (Washington and Ottawa: IJC 1975), p. 13.

[138] The 1972 Great Lakes Water Quality Agreement, Terms of Reference for the Establishment of a Research Advisory Board, Section 4.

[139] Alfred Beeton interview.

[140] Research Advisory Board, International Joint Commission, *Annual Report to the International Joint Commission* (Windsor, Ontario: IJC, July 1977).

[141] Great Lakes Science Advisory Board, International Joint Commission, *Annual Report of the Science Advisory Board* (Windsor, Ontario: IJC, July 1979), pp. 6–27.

[142] International Joint Commission, *Rules of Procedure and Text of Treaty* (IJC, 1965), Part I, Section 11, pp. 3, 4, 5.

[143] Princen and Finger, *Environmental NGOs in World Politics*, p. 71.

[144] Research Advisory Board, *Proceedings of a Workshop on Public Participation*, 1975.

[145] Pat Bonner interview.

[146] Mark Reshkin interview; Elaine Kaplan Beck interview. See also International Reference Group on Great Lakes Pollution from Land Use Activities, *Atmospheric Loading of the Lower Great Lakes and the Great Lakes Drainage Basin*,Report to the International Joint Commission (Windsor, Ontario: IJC, March 1977); and the PLUARG Public Consultation Panel Reports, Vol. 1 for the United States, and Vol. 2 for Canada.

[147] Jane Elder interview.

[148] Princen and Finger, *Environmental NGOs in World Politics*, pp. 77–78.

[149] The Swinehart paper describes how a question period was allowed in the 1980, 1981, and 1982 annual meetings ("Public Information and Participation Activities").

[150] Lee Botts, personal observation.

[151] Pat Bonner interview. The Swinehart paper also says that by 1978 a total of 5,000 copies of the Water Quality Board and Science Advisory Board reports were being distributed and that many of the 10,000 annual queries for information to the Great Lakes Regional Office were from the news media ("Public Information and Participation Activities").

[152] Pat Bonner interview.

[153] Pat Bonner interview. See also Princen and Finger, *Environmental NGOs in World Politics*.

[154] The Swinehart paper says that by 1978, the mailing list for Focus was 10,000 and that 2,000 requests for information were being received annually in writing and by telephone ("Public Information and Participation Activities").

[155] Lee Botts, personal observation.

[156] Edith Chase, personal communication; Lee Botts, personal observation.

[157] Tom Dustin interview.

[158] Jay Reed, personal communication.

[159] Jane Elder interview.

[160] Great Lakes Tomorrow and Purdue University Calumet, *Great Lakes Decisions: Decisions for the Great Lakes* (Hammond, Indiana: Great Lakes Tomorrow and Purdue University Calumet, 1982).

[161] Paul Muldoon, personal observation. See John E. Carroll, *Environmental Diplomacy: An Examination and Prospective Canadian-U.S. Transboundary Relations* (Ann Arbor, Mich.: University of Michigan Press, 1983), pp. 18–19.

[162] George Francis interview.

[163] Paul Muldoon, personal observation.

[164] Lee Botts, personal observation.

[165] Valdas Adamkus interview.

[166] International Joint Commission, Great Lakes Water Quality Board, *Great Lakes Water Quality 1974*, Appendix B: "Annual Report of the Surveillance Subcommittee to the Implementation Committee, Great Lakes Water Quality Board" (Windsor, Ontario: IJC, June 1975).

[167] The Water Quality Board reports in the early 1970s tracked how Canada initially had a larger proportion of its population served by "adequate" sewage treatment but how U.S. efforts to assist local communities to upgrade sewage treatment expanded rapidly under the construction grant program of Section 201 of the 1972 version of the Clean Water Act.

[168] Conflict persisted into the 1990s over the differences in the approach of the two countries to control of industrial discharges. The 1976 Water Quality Board report

described the differences as follows: "In the United States, the approach to implementing pollution control consists of a relatively structured, legal, regulatory enforcement system. . . . In Canada, existing legislation provides pollution control agencies with administrative discretion" (p. 114).

[169] Great Lakes Water Quality Board, International Joint Commission, *Great Lakes Water Quality 1975* (Windsor, Ontario: IJC), p. 51.

[170] U.S. Environmental Protection Agency, Office of the Regional Administrator, Region 5, *Detergent Phosphate Ban*, Position Paper Prepared by the Region 5 Phosphorus Committee (Chicago, Illinois: USEPA, June 1977).

[171] Lee Botts, personal observation.

[172] Nelson Thomas interview.

[173] The Region 5 position paper on phosphate bans estimated a total savings of $41.5 m. per year in sewage treatment in the Great Lakes basin, based on experience of the Metropolitan Sanitary District of Greater Chicago after Chicago adopted the first such ban.

[174] Inability to remove contaminated sediments because of the high treatment costs and lack of disposal sites remained a major problem in the mid-1990s. Nevertheless, the Water Quality Agreement as well as need to protect Lake Michigan as a drinking water source was being cited in 1996 as justification for proceeding with a novel approach to removing an estimated more than 1 million cubic yards of sediments from the Indiana Harbor and Ship Canal in East Chicago, Indiana, the largest known accumulation of contaminated sediments in the Great Lakes basin.

[175] Great Lakes Water Quality Board, International Joint Commission, *Great Lakes Water Quality 1977* (Windsor, Ontario: IJC, July 1978), pp. 6–7.

[176] Ibid., pp. 13–29.

[177] Great Lakes Research Advisory Board, International Joint Commission, *Great Lakes Water Quality Research Needs* (Windsor, Ontario: IJC, July 1976).

[178] Research Advisory Board, International Joint Commission, "Structure-Activity Correlations in Studies of Toxicity and Bioconcentration with Aquatic Organisms," (Published in the proceedings of a symposium sponsored by the Standing Committee on the Scientific Basis for Water Quality Criteria, Burlington, Ontario, March 11–13, 1975), ed. G.D. Veith and D.E. Konasewich (Windsor, Ontario: IJC, 1975).

[179] See Chapter 3 in Michael R. Reich, *Toxic Politics: Responding to Chemical Disasters,*

(Ithaca, New York and London: Cornell University Press, 1991).

[180] Lee Botts, personal observation.

[181] Revised Great Lakes Water Quality Agreement of 1978, Section 3.

[182] International Joint Commission, *Report on Great Lakes Water Quality for 1972* (Washington, D.C., and Ottawa: IJC, July 1973).

[183] International Joint Commission, *Second Annual Report on Great Lakes Water Quality* (Ottawa and Washington, D.C.: IJC, 1974), p. 1.

[184] International Joint Commission, *1974 Annual Report on Great Lakes Water Quality* (Ottawa and Washington, D.C.: IJC, December 1975), pp. 15–17.

[185] International Joint Commission, *Fifth Annual Report, Great Lakes Water Quality* (Windsor, Ontario: IJC, 1976), pp. 1–2.

[186] International Joint Commission, *Annual Report-1977* (Ottawa and Washington, D.C.: IJC, 1977), p. 18–19.

[187] Ibid., pp. 30–31

[188] Ibid., p. 38; General Accounting Office, *How the U.S. Should Improve Its Funding of IJC Activities* (Washington, D.C.: General Accounting Office, February 8, 1978), ID-78-10.

[189] Great Lakes Water Quality Board, International Joint Commission, *Sixth Annual Report to the International Joint Commission* (Windsor, Ontario: IJC, July 1978). In this report, the first two recommendations and five of the six highlights concerned toxic contaminants. It was noted that Canada had essentially met the target loading for phosphorus for Lake Erie and, while the inputs still exceeded the limits set in the 1972 Agreement for the lower lakes in general, substantial progress was noted.

[190] Revised Great Lakes Water Quality Agreement of 1978.

[191] Ibid.; Introduction, 1972 Great Lakes Water Quality Agreement of 1972.

[192] The terms of the new agreement were explained in an undated brochure titled *Great Lakes Water Quality Agreement 1978* issued by the International Joint Commission, United States and Canada.

[193] Revised 1978 Great Lakes Water Quality Agreement, Article 2.

[194] Revised Great Lakes Water Quality Agreement of 1978, Article 1 (v).

[195] International Joint Commission brochure, p. 4.

[196] W.J. Christie and J.R. Vallentyne, "Overview, Obstacles and Strategy," and M. Becker and J. Cowden, "Initiatives Developed at the Hiram Workshop," Parts A and B in *Implementing the Ecosystem Approach* (Summary of proceedings culminating in a workshop sponsored by the International Joint Commission and the Science Advisory Board, Great Lakes Fishery Commission and Board of Technical Experts, and the Petroleum Association for Conservation of the Canadian Environment, Hiram, Ohio, March 22–24, 1983).

[197] Great Lakes Water Quality Agreement of 1972, Article 9, section 3.

[198] Task Group III, Fifth Year Review of the Canada--United States Great Lakes Water Quality Agreement, Co-chairs J.R. Vallentyne, Senior Scientists, Canada Centre for Inland Waters, and N.A. Thomas, Chief, Large Lakes Research Station, U.S. Environmental Protection Agency, Grosse Ile, Michigan, February 1978.

[199] Ibid.; George Alexander interview.

[200] Ron Shimizu interview.

[201] S.J. Eisenreich, P.J. Emmling, and A.M. Beeton, "Atmospheric Loading of Phosphorus and Other Chemicals to Lake Michigan," *Journal of Great Lakes Research* 3 (1977): 291–304.

[202] The IJC's Third Annual Report on Progress for 1974, dated December 1975, discussed the then recent discoveries that low reproductive rates and birth deformities in wildlife were linked to the presence of PCBs and other chlorinated hydrocarbons, and referred to a recent resolution to alert the governments to the implications of the new findings.

[203] H. Sievering and C.A. Williams, *Potential Loading of Southern Lake Michigan by Dry Depositions*, Proceedings of a Workshop on Atmospheric Transport and Removal Processes, Second ICMSE Conference on the Great Lakes (Lemont, Illinois: Argonne

National Laboratory, 1975); W.R. Swain, "Chlorinated Residues in Fish, Water, and Precipitation from the Vicinity of Isle Royale, Lake Superior," *Journal of Great Lakes Research* 4, nos. 3–4 (1978): pp. 398–407.

[204] T.J. Murphy, Jean C. Pokojowzk, and Michael Mullin, "Vapor Exchange of PCBs in Lake Michigan: The Atmosphere as a Sink for PCBs," in *Physical Behavior of PCBs in the Great Lakes*, ed. Donald Mackay (Ann Arbor: Ann Arbor Press, 1982); Jerry Sullivan and Alicia Bixby, *A Citizen's Guide to Cleaning Up Contaminated Sediments* (Chicago: Lake Michigan Federation, 1989), describes how toxic substances can be released from contaminated sediments. U.S. General Accounting Office, *Water Resources: Future Needs for Confining Contaminated Sediment in the Great Lakes Region*, Report to the Chairman, Subcommittee on Water Resources, Committee on Public Works and Transportation, U.S. House of Representatives), GAO/RCED-92-89, describes difficulties in locating disposal sites.

[205] K.L.E. Kaiser, "Mirex: An Unrecognized Contaminant of Fishes from Lake Ontario," *Science* 185 (Washington, D.C., 1974): 523–525.

[206] International Joint Commission, *Great Lakes Water Quality Status Report on Organic and Heavy Metal Contaminants in the Lakes Erie, Michigan, Huron, and Superior Basins*, Great Lakes Water Board Appendix E (Windsor, Ontario: IJC, 1978).

[207] See NRC/RSC, *The Great Lakes Water Quality Agreement*, pp. 24–25.

[208] The complete list of reports is contained in the Bibliography of Reports issued under the Great Lakes Water Quality Agreements of 1972 and 1978, and the Protocol Amending the 1978 Agreement, updated annually by the International Joint Commission, Great Lakes Regional Office, Windsor, Ontario.

[209] R.L. Thomas, J.R. Vallentyne, K. Ogilvie, and J.K. Kingham, "The Ecosystems Approach: A Strategy for the Management of Renewable Resources in the Great Lakes Basin," in *Perspectives on Ecosystem Management for the Great Lakes: A Reader*, ed. Lynton K. Caldwell (Albany: State University of New York Press, 1988), p. 31.

[210] See Jack Manno, "Advocacy and Diplomacy in the Great Lakes: A Case History of Nongovernmental Organization Participation in Negotiating the Great Lakes Water Quality Agreement, *Buffalo Law Journal* 1, no. 1 (1993): 16–17. Robert J Mason, "Public Concerns and PLUARG: Selected Findings and Discussion," *Journal of Great Lakes Research* 6 (1980): 210–222. A.P. Grima and Robert J. Mason, "Apples and Oranges: Toward a Critique of Public Participation in Great Lakes Decisions," *Canada Water Resources Journal* (1983): 22.

[211] Thomas Princen and Matthias Finger, *Environmental NGOs in World Politics*, (Routledge, London and New York, 1994), pp. 77–78.

[212] International Joint Commission, International Reference Group on Great Lakes Pollution from Land Use Activities, *Atmospheric Loadings of the Lower Great Lakes and the Great Lakes Drainage Basin* (Windsor, Ontario: IJC, March, 1977.

[213] G.E. Burdick, E.J. Harris, T.M. Dean, J.H. Walker, J Skea, and C. Colby, "The Accumulation of DDT in Lake Trout and the Effect on Reproduction," *Trans American Fisheries Society* 93 (1964): 127–136.

[214] M. Gilbertson, "Pollutants in Breeding Herring Gulls in the Lower Great Lakes," *Canadian Field-Naturalist* 88 (1974): 273–280.

[215] An account of how the contemporary environmental justice movement began can be found in Citizen's Clearinghouse for Hazardous Wastes, *Love Canal: A Chronology of*

Events that Shaped a Movement (Falls Church, VA: Citizen's Clearinghouse for Hazardous Wastes, 1984).

[216] Thomas Jorling, personal communication to Lee Botts.

[217] Robert Slater interview.

[218] Kent Fuller, Conrad Kleveno, and Peter Cristich interviews.

[219] Daniel, "The Great Lakes Water Quality Agreement."

[220] Don Munton has provided some insight on this matter in "Great Lakes Water Quality: A Study in Environmental Politics and Diplomacy," in *Resources and the Environment: Policy Perspectives for Canada.*

[221] Jean Hennessey interview.

[222] The negotiating team for Environment Canada included James Bruce, Assistant Deputy Minister; Robert Slater, Director General, Ontario Region; and Ron Shimizu. Russell McKinney was from External Affairs. For USEPA, the team included George Alexander, Region 5 administrator; Tudor Davies, headquarters Water Division; and Conrad Kleveno, Office of International Activities. William Marks, Michigan Department of Natural Resources, represented the states.

[223] Casey Bukro, "Bureaucrats Note: That Blue Stuff Is the Great Lakes," *Chicago Tribune*, September 14, 1978.

[224] Conrad Kleveno interview.

[225] George Alexander interview.

[226] Most of the correspondence raising issues about the Regional Office and other issues during the preparation for the negotiation was signed by Jorling.

[227] Conrad Kleveno interview.

[228] United States Senior Review Group on Review of the Great Lakes Water Quality Agreement, "Report of Sub-Group A" (Washington, D.C.: Environmental Protection Agency, Office of International Activities, April 29, 1977).

[229] Robert Slater and Ron Shimizu interviews.

[230] Confidential interviews.

[231] Jane Elder interview.

[232] United States Senior Review Group on Review of the Great Lakes Water Quality Agreement, "Final Sub-Group A Report" (Washington, D.C.: U.S. Environmental Protection Agency, Office of International Activities), Attachment 5.

[233] Confidential interview.

[234] According to Munton, these meetings were attended by some 240 persons with the presentation of some 40 briefs (Munton, "Great Lakes Water Quality," p. 169).

[235] "Final Sub-Group A Report," pp. 6–7.

[236] Munton, "Great Lakes Water Quality," p. 170.

[237] Ibid.

[238] "Final Sub-Group A Report."

[239] Don Munton, "Great Lakes Water Quality: A Study in Environmental Politics and Diplomacy," in *Resources and the Environment, Policy Perspectives for Canada,* p. 171.

[240] Ron Shimizu and George Alexander interviews.

[241] George Alexander interview.

[242] A copy of this memo is in the Lee Botts collection, Calumet Archives, at Indiana University Northwest.

[243] Memo from Alice Brandeis Popkin, to Paul Elston, Deputy Assistant Administrator for Resources Management, USEPA in Washington, D.C.; Letter from Richard D. Vine, Deputy Assistant Secretary for Canadian Affairs to Barbara Blum, Deputy Administrator, U.S. Environmental Protection Agency, 1979.

[244] "Carter Urged to Seek Funds for Accord on Great Lakes," *Toledo Blade,* November 28, 1978.

[245] Other issues, such as new standards for radionuclides, were also considered (Munton, "Great Lakes Water Quality," p. 171).

[246] On September 14, 1978, a *Milwaukee Journal* editorial under the title "Soiling the Great Lakes Cleanup," protested a reported attempt by the U.S. Office of Management and Budget to get Article 2 deleted from the agreement with protests over the estimated $6 million expenditure that would be required to meet agreement obligations.

[247] Confidential interview.

[248] Lee Botts, personal observations, based on protests from the states to her in her capacity as chairman of the Great Lakes Basin Commission from 1978 to 1981.

[249] First proposed by Canadian Henry Regier in the mid-1980s, an *Ecosystem Charter for the Great Lakes-St. Lawrence Basin* was developed by the Great Lakes Commission in 1994 as "a statement that summarizes commonly held principles for pursuing an 'ecosystem approach' to Great Lakes-St. Lawrence Basin management. The charter is described as a non-binding "good faith" agreement.

[250] Great Lakes Water Quality Agreement of 1978, Article 1 (g).

[251] Great Lakes Science Advisory Board, *The Ecosystem Approach: Scope and Implications of an Ecosystem Approach to the Transboundary Problems in the Great Lakes Basin*, Special Report to the International Joint Commission (Windsor, Ontario: IJC, 1978), p. 1.

[252] Research Advisory Board, International Joint Commission, *1978 Annual Report* (Windsor, Ontario: IJC, 1978), p. 1.

[253] Great Lakes Science Advisory Board, *The Ecosystem Approach*, p. 2.

[254] International Joint Commission, *Fifth Annual Report.*

[255] Ibid., Appendix.

[256] Great Lakes Science Advisory Board, *The Ecosystem Approach.*

[257] Jack Vallentyne interview.

[258] Great Lakes Science Advisory Board, *The Ecosystem Approach.*

[259] Revised Great Lakes Water Quality Agreement of 1978, Article 2 (a).

[260] Lee Botts, personal observation.

[261] Ron Shimizu and George Alexander interviews.

[262] Confidential interview.

[263] Revised Great Lakes Water Quality Agreement of 1978, Article 1 (v).

[264] The Phosphorous Load Reduction Supplement to Annex 3 was signed on October 7, 1983. It allocates target loads between the two countries for Lake Erie and Lake Ontario and pledges both sides to maintain the "present oligotrophic state" of Lake Superior and Lake Huron. The U.S. also agreed to substantial elimination of algal nuisance in Lake Michigan, with additional efforts in Saginaw Bay, Green Bay, and other localized nearshore problem areas.

[265] Carl A. Esterhay, "Restoring the Water Quality of the Great Lakes: The Joint Commitment of Canada and the United States," *Canad--United States Law Journal* 4 (1981): 208–231.

[266] Confidential interview.

[267] International Joint Commission, *Seventh Annual Report: Great Lakes Water Quality* (Ottawa and Washington, D.C.: IJC, 1980.

[268] Revised Great Lakes Water Quality Agreement of 1978, Article 8 (a).

[269] International Joint Commission, IJC Directive No. 1 to the Great Lakes Water Quality Board Pursuant to the 1978 Great Lakes Water Quality Agreement dated March 14, 1980; Revised Great Lakes Water Quality Agreement of 1978, Terms of Reference for the Joint Institutions and the Great Lakes Regional Office. According to Directive No. 1, the selected key functions are as follows:

5. The Board shall keep currently informed regarding the matters assigned to the Commission under Article 7 of the Agreement. The Board shall also keep informed regarding programs and other measures taken with respect to, or relevant to, implementation of the Agreement and shall assess the adequacy and effectiveness of such programs, in particular those specified under the Agreement under Article 6 (1) and the Annexes referenced therein.
6. The Board shall be responsible for the collation, assessment, and analysis of data and information relevant to paragraph 5. The Board shall review, as appropriate, procedures for the submission of such data from the various jurisdictions and recommend changes to the Commission as appropriate.
7. The Board shall tender timely advice on all matters concerning the Agreement and further shall submit a full report to the Commission biennially, beginning in 1981, upon all aspects relating to the operations and effectiveness of the Agreement, and on the Board's activities. In alternate years, the Board shall submit a summary report updating all or part of the previous report to the extent that information is available.
12. With respect to the programs and other measures upon which the Board shall report to the Commission, the Board shall:
    (a) make recommendations on the development and implementation of programs to achieve the purpose of the Agreement as set forth in Article 2 thereof;
    (b) assemble and evaluate information evolving from such programs;
    (c) identify deficiencies in the scope and funding of such programs and evaluate the adequacy and compatibility of the results;
    (d) examine the appropriateness of such programs in the light of current and future socio-economic imperatives; and
    (e) advise the Commission on the progress and effectiveness of such programs and submit appropriate recommendation.

[270] Role, Structure and Operation of the Great Lakes Water Quality Board, Final Proposal, 26 February 1980, approved at the Forty-Second Meeting of the Great Lakes Water Quality Board, July 15, 1980.

[271] Kent Fuller and Peter Wise interviews.

[272] C. Ian Jackson, "Editorial: Mixed Signals from the International Joint Commission," *Journal of Great Lakes Research* 18, no. 3 (1992): 355.

[273] Confidential interview.

[274] Peter Wise interview.

[275] Robert Slater, Ron Shimizu, and Andy Hamilton interviews.

[276] NRC/RSC, *The Great Lakes Water Quality Agreement*, p. 87. Concerns identified in this report included the data collection process. The NRC/RSC was critical of the fact that there was little effective interagency coordination among state, federal, and provincial governments (p. 84). Complete data sets were provided only for some jurisdictions and some of the most obvious questions about total loadings of toxic substances, specific chemicals, and the relative contribution of sources were left with only partial or even no response from a basin-wide perspective.

There was also the issue of the "completeness" of the data being collected and transmitted by the WQB to the Commission. The report noted that "the Board is composed of senior officials who represent these governments. While these representatives may be willing to share sensitive information among themselves, they may be less willing to share it with the Commission or to release it publicly" (p. 85).

[277] For example, the Third Biennial Report in 1986 emphasized the need for greater interagency coordination between the parties for monitoring and surveillance as well as research.

[278] Great Lakes United, *Unfulfilled Promises: A Citizens Review of the Great Lakes Water Quality Agreement*, (Buffalo, New York: GLU, 1987).

[279] See NRC/RSC, *The Great Lakes Water Quality Agreement*,pp.90–91, where the ; International Joint Commission, *Second Biennial Report*, is quoted and discussed.

[280] Ibid.

[281] International Joint Commission, IJC Directive to the Great Lakes Science Advisory Board. In carrying out this responsibility, the SAB is to:

"(a) keep informed on scientific and research matters encompassed within the scope of the 1978 Great Lakes Quality Agreement and as it deems appropriate shall seek analyses, assessments, and recommendations from other scientific, professional, academic, governmental, and inter-governmental groups relevant to Great Lakes Basin Ecosystem research and scientific knowledge;

Further, the SAB shall:

(i) assess the impact and the adequacy of research efforts;
(ii) assess the reliability and potential applicability of research results;
(iii) identify research priorities and additional research requirements; and
(iv) identify specific research programs for which international cooperation is desirable."

[282] Jack Vallentyne and Nelson Thomas interviews.

[283] NRC/RSC, *The Great Lakes Water Quality Agreement*, p. 89.

[284] Lee Botts, personal observation.

[285] John Gannon interview.

[286] Pat Bonner interview.

[287] International Joint Commission, "Report on the Regional Office of the International Joint Commission" (Washington, D.C.: IJC, April 1979).

[288] Ibid., p. 4.

[289] NRC/RSC, *The Great Lakes Water Quality Agreement,* p. 89. The issue was also addressed by the IJC in its first Biennial Report in 1981, p. 29.

[290] Valdas Adamkus interview.

[291] Confidential interview.

[292] Most of this section is derived from a report prepared by John Jackson for the project. See John Jackson, "The Provinces and the Great Lakes Water Quality Agreement."

The COA was renegotiated again in 1986, and was effectively retroactive to April 1, 1985. It was, with a few changes, a word-to-word continuation of the previous COAs. It continued the surveillance provisions but phased out the federal government's sewage support program and added two elements:

1. A commitment to work together and share costs of the "Phosphorus Load Reduction Program" that had been added to the GLWQA in 1983; and
2. A commitment to work together to assess and classify the Areas of Concern that the Water Quality Board had identified in 1985 and to develop Remedial Action Plans for the Areas of Concern.

See Canada-Ontario Agreement Respecting Great Lakes Water Quality, Appendix 1 of Schedule B, April 1985.

[293] Annual Report, *Canada-Ontario Agreement Respecting Great Lakes Water Quality,* October 1984, p. 18.

[294] Toby Vigod, "The Law and the Toxic Blob," *Alternatives* 13, no. 3 (September/October 1986): 24–28.

[295] Ontario Ministry of the Environment, *A Policy and Program Statement of the Government of Ontario on Controlling Municipal and Industrial Discharges into Surface Waters* (Ontario: Ontario Ministry of the Environment, 1986).

[296] Nevertheless, because of the obvious impact of the Agreement on the environment of Quebec, this province is included in certain Great Lakes activities. There is always a representative of the Province of Quebec on the Water Quality Board, usually the *Chef du Service des Pesticides et des Eaux Souterraines.* A Quebec representative is also included in the negotiating team when the Agreement is reviewed or renegotiated. The role that Quebec plays is that of a watchdog, monitoring to make certain that pollution control in the Great Lakes will reduce the contamination of the St. Lawrence River flowing through Quebec.

[297] Lyman Wible interview.

[298] Tom Dustin interview.

[299] Lyman Wible interview.

[300] The Great Lakes Toxic Substances Control Agreement, signed May 21, 1986, by the governors of the eight Great Lake states.

[301] Tom Martin interview. The agreement called for "coordinated regional action" in accordance with six principles. In addition to recognizing the "economic and environmental

importance" of water resources that "transcend political boundaries," the agreement called for management "as an integrated ecosystem" to satisfy both requirements of the Clean Water Act and the binational agreement aim "to virtually eliminate" the discharge of all persistent toxic substances. The agreement's purposes were to be achieved by cooperation among "local and state agencies, regional groups, the federal government, the International Joint Commission, and the public."

These purposes echoed the spirit of the binational accord but the state agreement went further in committing the governors to lobbying and advocacy of the federal government "through appropriate national associations and their Congressional delegations." The reason was that "the toxic substances threatening the Great Lakes are not confined to the region . . . and yet the federal government has historically been unable to establish . . . uniform national standards [whose] absence may encourage competition for economic development to the detriment of the Great Lakes Region and endanger public health and the environment."

The agreement included an action or implementation plan for the states themselves. Principle actions were to include:

1. Various measures to increase the role of the states, including the seeking of "an active role for the States should renegotiation of the Agreement be agreed to by the federal governments of the United States and Canada";
2. As in the diversions charter, giving notice to each other, in this case when (a) considering a permit for a discharge of new water quality standard, or (b) in defined circumstances, pertaining to the accidental discharge of pollutants;
3. Support of research, monitoring, and surveillance programs, as well as coordination of collecting compatible water quality and health data;
4. Development of common health advisories for fish consumption for each lake;
5. Establishment of a Great Lakes Water Quality Fund to permit "continuing progress toward a healthier Great Lakes ecosystem";
6. Achievement of uniform state regulations for toxic releases.

[302] Tim Eder interview.

[303] U.S. Environmental Protection Agency, Region 5, the Indiana Board of Health, and the Lake Michigan Federation, *A Master Plan for Improving Water Quality in the Grand Calumet River and the Indiana Harbor and Ship Canal* (Chicago: USEPA, 1983).

[304] Great Lakes Water Quality Board, International Joint Commission, *1985 Report on Great Lakes Water Quality* (Windsor, Ontario: IJC, June 1985).

[305] Peter Wise interview.

[306] International Joint Commission, Standing Committee on Public Information, Terms of Reference as approved September 2, 1980.

[307] Pat Bonner interview.

[308] International Joint Commission, Public Participation Policy, November 7, 1980.

[309] Wayne Schmidt interview.

[310] The concept of citizen suits in Section 505 was included in the Clean Water Act on the initiative of Senator Philip Hart (D.) of Michigan. His proposal was based on a Michigan law that had been developed by Joseph Sax of the University of Michigan Law School at the request of Joan Wolf, a citizen activist who founded the West Michigan Environmental Council and organized the state-wide effort that obtained passage of the Michigan law.

[311] Paul Muldoon, personal observation. The differences in the role of citizens in the two countries are discussed in Manno, "The Emerging Great Lakes Community."

[312] Jane Elder interview.

[313] Tim Eder interview.

[314] Wayne Schmidt interview. Manno also discusses how Great Lakes groups formed alliances to oppose winter navigation in *The Emerging Great Lakes Community.*

[315] Adele Hurley, who was named Canadian chair of the IJC in 1995, was the executive director of the lobbying organization that Ontario set up in Washington, D.C., to seek legislative control of the precursors of acid rain.

[316] The consequences of these changes are considered in Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Washington, D.C. and Covelo, California: Island Press, 1994).

[317] Manno, "The Emerging Great Lakes Community," p. 84.

[318] For a more indepth review, see Paul Muldoon, *Cross Border Litigation: Environmental Rights in the Great Lakes Ecosystem* (Toronto: Carswell, 1986), Appendix C.

[319] Manno, "The Emerging Great Lakes Community."

[320] The Sierra Club has more freedom to lobby on legislation because it lost its tax exempt status under Section 501(c)3 of the U.S. Internal Revenue Service code in the 1960s. Organizations eligible to receive contributions that are tax exempt cannot devote more than a small fraction of their resources to partisan political activity or direct lobbying on legislation.

[321] Glenda Daniel, personal communication.

[322] Jane Elder interview.

[323] Lee Botts, personal observation.

[324] Clean Water Act, Section 118(a)(2).

[325] Elise Beam and Mark Van Putten interviews.

[326] International Joint Commission, Minutes of Public Information Committee meeting, November 7–8, 1980, at Montreal.

[327] Attendance figures provided by International Joint Commission, Great Lakes Regional Office.

[328] Pat Bonner interview.

[329] Jean LaForge interview.

[330] Jane Elder interview.

[331] Wayne Schmidt and John Jackson interviews.

[332] Lee Botts, personal observation.

[333] One of the most significant Wingspread events was the meeting of experts in the fields of anthropology, immunology, medicine, law, toxicology, wildlife management, zoology, and others on July 26–28, 1991. The result was a consensus statement signed by 21 scientists concerning the role of chemically induced alterations in sexual development and the implications for human health of effects in wildlife of exposure to toxic chemicals in the Great Lakes and elsewhere.

[334] Glenda Daniel interview.

[335] Peter Wise interview.

[336] Paul Muldoon, personal observation.

[337] Allegra Cangellosi interview.

[338] See Caldwell, *Perspectives on Ecosystem Management for the Great Lakes*. This book was based on the concepts that were considered in the series of meetings and workshops that comprised the first and second interuniversity seminars organized in connection with implementation of the Great Lakes agreement.

[339] Philip Jessup, personal communication to Lee Botts.

[340] NRC/RSC, *The Great Lakes Water Quality Agreement*, p. 58.

[341] Ibid., p. 107.

[342] Theodora E. Colborn, A. Davidson, S.N. Green, R.A. Hodge, C.I. Jackson, and R.A. Liroff, "Foreword," in *Great Lakes, Great Legacy?* (Washington, D.C.: Conservation Foundation, and Ottawa, Canada: Institute for Research on Public Policy, 1990), p. xiv.

[343] Ibid.

[344] Theodora E. Colborn, Dianne Dumanoski, and John Peterson Myers, *Our Stolen Future* (New York: Dutton, 1996).

[345] Paul Botts, "The Breath of a Child or the Wind of Change: Assessing the Impact of the Great Lakes Water Quality Agreement on Nutrient and Toxic Pollution of the Great Lakes" (Prepared for the Great Lakes Governance Project of Dartmouth College, February 1996).

[346] The 1975 effort of the RAB to identify characteristics that caused chemicals to bioconcentrate anticipated the effort to determine "bioaccumulation factors" in connection with the 1993 promulgation of the Great Lakes Water Quality Initiative by the USEPA. See G.D. Veith and D.E. Konasewich, eds., *Structure-Activity Correlations in Studies of Toxicity and Bioconcentration with Aquatic Organisms,* Proceedings of a Symposium sponsored by the Research Advisory Board Standing Committee on the Scientific Basis for Water Quality Criteria, Burlington, Ontario, March 11–13, 1975 (Windsor, Ontario: IJC, 1975), 347 pp.

[347] International Joint Commission, *Cleaning Up Our Great Lakes: A Report on Toxic Substances in the Great Lakes Basin Ecosystem* (Windsor, Ontario: IJC, August 1991), p. 14. The 11 critical pollutants are listed as: PCBs, DDT and its breakdown products, dieldrin, toxaphene, dioxin (2,3,7,8,-TCDD), furan, mirex, benzo(a)pyrene, hexa\chlorobenzene, and alkylated lead.

[348] J.J. Black, "Aquatic Animal Neoplasms as an Indicator for Carcinogenic Hazards to Man," in *Hazard Assessment of Chemicals: Current Developments*, Vol. 3, ed. J. Saxene (New York: Academic Press, 1984), pp. 181–232.

[349] T.J. Kubiak, H.J. Harris, L.M. Smith, T.R. Schwartz, D.L. Stalling, J.A. Trick, L. Sileo, D.E. Docherty, and T. Erdman, "Microcontaminants and Reproductive Impairment of the Forster's Tern on Green Bay, Lake Michigan," *Archives of Environmental Contamination and Toxicology* 189 (1983): 706–727; J.P. Giesy, J.P. Ludwig, and D.E. Tillit, "Deformities in Birds of the Great Lakes Region: Assigning Causality," *Environmental Science and Technology* 28 (1994): 128–135.

[350] H.E.B. Humphrey, *Evaluation of Changes in the Level of Polychlorinated Biphenyls (PCBs) in Human Tissue* (Lansing, Michigan: Michigan Department of Public Health, 1976).

[351] Christie and Vallentyne, "Overview, Obstacles and Strategy"; Becker and Cowden, "Initiatives Developed at the Hiram Workshop"; NRC/RSC, *The Great Lakes Water Quality Agreement*..

[352] The context for the U.S.-Canada relationship with respect to the environment is detailed in a series of articles in *International Environmental Affairs*. See M. Valiante and P. Muldoon, "Annual Review of Canada-U.S. Environmental Relations: 1988," *International Environmental Affairs* 1, no. 3 (1989): 294–308; M. Valiante and P. Muldoon, "Annual Review of Canada-U.S. Environmental Relations: 1989," *International Environmental Affairs* 2, no. 3 (1990): 252–264; M. Valiante and P. Muldoon, "Annual Review of Canada-U.S. Environmental Relations: 1990," *International Environmental Affairs* 3, no. 3 (1991): 207–218; M. Valiante and P. Muldoon, "Annual Review of Canada-U.S. Environmental Relations: 1991," *International Environmental Affairs* 4, no. 3 (1992): 254–272; M. Valiante and P. Muldoon, "Annual Review of Canada-U.S. Environmental Relations: 1992," *International Environmental Affairs* 5, no. 3 (1993): 200–218.

[353] William K. Reilly, Administrator, U.S. Environmental Protection Agency: "Remarks at the Release of *Great Lakes, Great Legacy*," Chicago, Illinois, October 11, 1989; "Aiming Before We Shoot: The 'Quiet Revolution' in Environmental Policy," Address to the National Press Club, Washington, D.C., September 26, 1990.

[354] Valdas Adamkus interview.

[355] Jane Elder interview.

[356] The U.S. Great Lakes Critical Programs Act (PL 101-380, 18 August 1990) is an amendment to the Clean Water Act.

[357] Section 112(m) of the 1990 Clean Air Act (U.S. P.L. 101-549, U.S Sections 7401 et seq.) required USEPA to study atmospheric deposition of toxic contaminants into the Great Lakes, Lake Champlain, Chesapeake Bay, and coastal waters. The subsequent "Great Waters report" relies mainly on data resulting from Great Lakes research. U.S. Environmental Protection Agency, *Deposition of Air Pollutants to the Great Waters: First Report to Congress* (Research Triangle Park, N.C.: USEPA, Office of Air Quality Planning and Standards Research, May 1994), EPA-453/R-93-055.

[358] U.S. Great Lakes Fish and Wildlife Restoration Act (PL 101-537). The subsequent report to Congress discusses fishery management issues including the increasing presence of nonindigenous species. See *Report to Congress: Great Lakes Fishery Resources Restoration Study,* (Washington, D.C.: U.S. Fish and Wildlife Service, Department of the Interior, 1995).

[359] Canadian Environmental Protection Act, 1988.

[360] Environment Canada, "New Federal Regulations to Control Pulp and Paper Pollution," News Release, December 4, 1991.

[361] See Peter Gorrie, "Ottawa Ebbs on Paper-Mill Effluents," *Toronto Star*, November 9, 1991, p. D6; and Canadian Institute for Environmental Law and Policy, *Response to the Federal Pulp and Paper Regulatory Strategy* (Toronto: Canadian Institute for Environmental Law and Policy, May, 1990).

[362] Burkhard Mausberg, *Still the B.A.T. for Water Quality? A Four Year Review of the Ministry of the Environment's Municipal/Industrial Strategy for Abatement (MISA)* (Toronto: Pollution Probe and the Canadian Institute for Environmental Law and Policy, 1990).

[363] Although the regulations aimed for zero discharge, the actual regulatory limit was something different. However, the facilities are required to submit plans as to how those facilities would reach zero discharge within a specified time.

[364] Province of Ontario, Ministry of the Environment and Energy, "Clean Water Regulation for Ontario's Pulp and Paper Industry Becomes Law," News Release, November 25, 1993.

[365] Canada-United States Air Quality Agreement, signed March 13, 1991, in Ottawa. See Richard J. Smith, and Susan Biniaz, "Beyond Dispute: An Air Quality Agreement in the Context of a Consultative Relationship," *Canada-U.S. Law Journal* 17 (1991): 421–429; Agreement between the Government of Canada and the Government of the United States of America on Air Quality, Article 9.

[366] The Wingspread/Dartmouth Binational Working Conference on Acid Precipitation was held at the Wingspread Conference Center, Racine, Wisconsin, on October 1–5, 1984, to consider the possible relationship between the Great Lakes Agreement and the air quality agreement.

[367] The only role of the IJC is to transmit comments received, without providing its own independent advice, comment, or recommendations. In November of 1995, the IJC held hearings on progress under the accord. In addition to a number of written submissions, fourteen oral presentations were made in Ottawa and one in Washington, D.C. See the IJC Summary Response Document, December 1995.

[368] The USEPA programs are described in Bill Clinton, and Al Gore, Reinventing Environmental Regulation, (Washington, D.C.: Executive Office of the President, March 16, 1995).

[369] See Council of Great Lakes Governors, *The Great Printers Project: Recommendations to Make Pollution Prevention a Standard Practice in the Printing Industry* (Chicago, Illinois: Council of Great Lakes Governors, July 1994). This joint project of the Governors Council with the Environmental Defense Fund and the Printing Industries of America included agreements among the states to purchase paper produced by pollution prevention methods in order to create a market incentive. The program was supported with funding from the Great Lakes Protection Fund.

[370] Jane Dustin, personal communication.

[371] Under the North American Agreement on Environmental Cooperation Between the Government of Canada, the Government of the United Mexican States, and the Government of the United States (1993), the CEC is governed by a council comprised of the heads of the environmental agencies in all three countries. The day-to-day activities of the CEC, however, are managed by a secretariat with three directors, one appointed by each country. One of the directors serves as the executive director. The council appoints a Joint Public Advisory Committee.

The functions of the council include developing recommendations on pollution prevention, scientific research, public awareness of the environment, protection of endangered species, and many other matters (Article 10[2]).

The powers of the Commission include:

1. Under Article 13, the Secretariat has the ability to prepare a report for the Council on any matter within the scope of the annual programs;
2. Under Article 14, the Secretariat is empowered to receive a submission from any non-governmental organization or person asserting that a Party is failing to effectively enforce its environmental law, and then there is a process to follow upon the filing of the complaint; and

3. Under Article 22, there is a process for any Party to request consultations with any other Party regarding whether there has been a persistent pattern of failure by that other Party to effectively enforce its environmental law.

In 1996 a resolution was under consideration to "limit certain pollutants between the three countries," and a bird die-off at the Silva Creek reservoir is being investigated (Update on CEC Activities, October 1995).

[372] Commission for Environmental Cooperation, Resolution 5/95. The four substances are mercury, DDT, PCBs and chlordane.

[373] Nevertheless, an IJC influence is present through personnel recruited at the CEC. The first U.S. director was Jean Hennessey, a former IJC commissioner. Janine Ferretti, the first Canadian director, was a former executive director of an environmental organization that had an historical presence in Great Lakes issues. The staff scientist for the CEC was the former staff scientist for the IJC in Ottawa.

[374] See Canadian Council of the Ministers of the Environment, *Environmental Management Framework Agreement*, October 1995. For an in-depth analysis, see report by K.L. Clark and M.S. Winfield, *The Environmental Management Framework Agreement: A model for Dysfunctional Federalism* (Toronto: Canadian Institute for Environmental Law and Policy, Brief 96/1, February 1996).

[375] See K.L. Clark and M. Winfield, "Harmonizing to Protect the Environment? An Analysis of the CCME Environmental Harmonization Process," November 1996.

[376] Government of Canada, *CEPA Review: The Government Response: Environmental Protection Legislation Designed for the Future: A Renewed CEPA: A Proposal*, Response to the Recommendations of the Standing Committee on Environment and Sustainable Development as Outlined in its Fifth Report, *It's About Our Health! Towards Pollution Prevention*, CEPA Revisited (The Queen's Printer: Ottawa, December 1995).

[377] Ministry of the Environment and Energy, *Responsive Environmental Protection: A Consultation Paper* (July 1996). Also see Canadian Environmental Law Association, *Responding to the Roll-Backs* (Toronto: October 1996).

[378] Ontario Ministry of the Environment and Energy, Responsive Environmental Protection, Toronto, 1996, pp. 52–53.

[379] J.J. Black, "Field and Laboratory Studies of Environmental Carcinogenesis in Niagara River Fish," *Journal of Great Lakes Research* 9 (1983): 326–334.

[380] David DeVault, Paul Bertram, D.M. Whittle and Sarah Rang, *Toxic Contaminants. in the Great Lakes*, Background Paper for 1994 State of the Lakes Ecosystem Conference (Chicago: Environment Canada and USEPA, August 1995), EPA 905-R-95-016.

[381] J. Jacobson, S. Jacobson, and P. Schwartz, "Prenatal Exposure to an Environmental Toxin: A Test of the Multiple Effects Model," *Developmental Psychology* 20, no. 4 (1984): 523–532; S. Jacobson, G. Fein, and J. Jacobson, "The Effect of Intrauterine PCB Exposure on Visual Recognition Memory," *Child Development* 56 (1985): 853–860; E. Lobnky, J. Reihman, T. Darvill, J. Mather Sr., and H. Daly, "Neonatal Behavioral Assessment Scale Performance in Humans Influenced by Maternal Consumption of Environmentally Contaminated Lake Ontario Fish, *Journal of Great Lakes Research* 22, no.2 (1996): 198–212.

[382] Peter Montague, Chemicals and the Brain, Part 1, June 20, 1996 and Part 2, July 4, 1996, *Rachel's Environment and Health Weekly*, Environmental Research Foundation, Annapolis, Maryland.

[383] Arnold, Steven F. and others, "Synergistic Activation of Estrogen Receptor with Combinations of Environmental Chemicals," *Science* 272 (June 7, 1996): 1489–1492.

[384] IJC, *Fifth Biennial Report*, p. 15.

[385] IJC, *Sixth Biennial Report*, p. 18.

[386] IJC, *Seventh Biennial Report*, pp. 4–5.

[387] IJC, *Eighth Biennial Report*, p. 11.

[388] Environment Canada and the U.S. Environmental Protection Agency, *Toxic Contaminants in the Great Lakes*.

[389] W.W. Bowerman, V.J. Kramer, and J.P. Giesy, "A Review of Factors Affecting Productivity of Bald Eagles in the Great Lakes Region: Implications for Recovery" (Abstract from *Environmentally Induced Alterations in Development: A Focus on Wildlife*, Racine, Wisconsin, December 10–12, 1993).

[390] International Joint Commission, *Third Biennial Report* (Windsor, Ontario: IJC, December 1986), p. 8.

[391] This account of the negotiations is based on interviews with both government and NGO participants and a paper prepared by John Jackson for this project, "The Negotiation of the 1987 Protocol to the Great Lakes Water Quality Agreement" (Prepared for the Great Lakes Governance Project of Dartmouth College, February 1996).

[392] Andrew Hamilton interview.

[393] Pat Hill interview.

[394] Jane Elder, Valdas Adamkus interviews.

[395] Peter Wise interview.

[396] Jane Elder and John Jackson interviews.

[397] C. Ian Jackson, "Mixed Signals from the International Joint Commission," pp. 355–356.

[398] John Gannon, Presentation at the annual meeting of the International Association for Great Lakes Research, East Lansing, Michigan, May 30, 1995.

[399] Headlines in *Rachel's Hazardous Waste News*, published weekly by the Environmental Research Foundation, Annapolis, Maryland, reported every development with such headlines as "New Study Links DDT to Breast Cancer," (No. 334, April 22, 1993); "Are Environmental Chemicals Causing Men to Lose Their Fundamental Masculinity?" (No. 342, June 24, 1993); "Dioxin Reassessed," (No. 390, May 26 and June 7, 1994); "Two More Studies Show Human Soperm Loss," (No. 432, March 9, 1995); and "perm in the News," (No. 477, January 18, 1996).

[400] The minutes of the first nine meetings of the Binational Executive Committee were reviewed for this project.

[401] Chris Grundler interview.

[402] International Joint Commission, Indicators for Evaluation Task Force, *Indicators to Evaluate Progress under the Great Lakes Water Quality Agreement*, Windsor, Ontario, April, 1996.

[403] Peter Wise interview.

[404] Paul Bertram interview.

[405] Gordon Durnil and Hilary Cleveland interviews.

[406] Confidential interviews.

[407] International Joint Commission, Revised Great Lakes Water Quality Agreement as Amended by Protocol, signed November 18, 1987.

[408] A.L. Hamilton, Memorandum to Commissioners, dated March 15, 1988. See also C. Ian Jackson, and David Runnalls, *The Great Lakes in the 1990s: An Environmental Scan for a Renewed Canada--Ontario Agreement* (Ottawa: Institute for Research on Public Policy, July 1991), p. 9. The report was prepared at the request of the Ontario Ministry of the Environment and Environment Canada, 1991. This issue is discussed in more detail in Part 1 of this report.

[409] Gordon Durnil interview. See also Chapter 2 in Gordon Durnil, "The International Joint Commission" in *The Making of a Conservative Environmentalist* (Bloomington, Indiana: Indiana University Press, 1995).

[410] International Joint Commission, *Task Force Report on the IJC's Roles and Priorities under the Revised Great Lakes Water Quality Agreement* (Windsor, Ontario: IJC, April 1990).

[411] The original task force was reconstituted in accordance with the Commission's decision at its December 1990 Executive Meeting, and its directives are contained in the Commission's Memorandum of Understanding of December 12, 1990. The *Task Force Report on the IJC's Roles and Priorities under the Revised Great Lakes Water Quality Agreement* was discussed by the boards and council at the IJC semi-annual meeting in the spring of 1990, and set the stage for a redefinition of the roles of the commission and its advisory boards. The report was then reviewed and revised by a "Reconstituted Task Force" which delivered its report in March of 1991. The document was accepted in April 1991, at a meeting in Washington, D.C., and hereinafter will be referred to as the "Reconstituted Task Force Report" (International Joint Commission, *Reconstituted Task Force on Commission's Role and Priorities under the Great Lakes Water Quality Agreement* [Windsor, Ontario: IJC, March 15, 1991]).

[412] IJC, "Reconstituted Task Force Report."

[413] Ibid., p. 2.

[414] Minutes of the 84th Science Advisory Board Meeting, November 19–21, 1991, held at Burlington, Ontario.

[415] The *1979 Annual Report of the Water Quality Board* (Windsor, Ontario: IJC, 1979) refers to the SAB recommendations about the potential effects of acid rain within the Great Lakes ecosystem in recommending attention to this issue (p. 50).

[416] Orie Loucks interview.

[417] Ibid.

[418] International Joint Commission, *1993–1995 Priorities and Progress Under the Great Lakes Water Quality Agreeement* (Ottawa and Washington: August 1995).

[419] Paul Muldoon, personal observation.

[420] For example, there was considerable interest by some board members concerning the progress of a clean-up at the General Motors site at Massena, New York. See Minutes of the 99th Meeting of the Science Advisory Board, September 22, 1995, Duluth, Minnesota.

[421] International Joint Commission,"Priorities Document: For Discussion at Traverse City" (Ottawa and Washington: September 1991); International Joint Commission, "1993–1995 Priorities and Progress Under the Great Lakes Water Quality Agreeement" (Ottowa and Washington: August 1995); International Joint Commission, "1995–1997 Proposed Priorities" (Ottawa and Washington: September 15, 1995).

[422] Paul Muldoon, personal observation.

[423] In the minutes to a 1992 SAB meeting, Commissioner Durnil outlined the rationale for the priorities process:

> In the first instance, it was the responsibility of the Commission to give direction; and in the second, there is limited funds and so the resources need to be directed and managed to address the most important issues . . . despite the considerable increase in budget over the years, the increase has not been reflected in the programs of the Boards, or used directly to address water quality matters. There was a sense then, that too much was being spent on overhead, to the detriment of program activities under the Agreement.

Minutes of the 84th Science Advisory Board Meeting, November 19–21, 1991, held at Burlington, Ontario, p. 3.

[424] NRC/RSC, *The Great Lakes Water Quality Agreement,* p. 89.

[425] IJC, *Reconstituted Task Force Report*, p. 3.

[426] Ibid.

[427] With new roles and responsibilities being delegated to the parties, the role for the WQB obviously had to change. It is not clear what other options were considered but the "Reconstituted Task Force Report" outlined in detail the new terms of reference for the WQB (see Appendix A). Appendix A is the full text of the new mandate of the WQB. The important provisions listed on p. 3 are as follows:

1. The Water Quality Board's function is to give advice on broad policy questions, including Commission priorities.
2. To provide the Commission with advice from the perspective of each member's current experience; the membership of the Water Quality Board should continue to be drawn from senior levels of federal, provincial and state government;
3. The existing substructure of the Water Quality Board should be disbanded subject an orderly transition through October 1991 as envisaged in Section C.3 (Transition Period) below.
4. (The Water Quality Board is) to make assessments of progress on implementation of of the Agreement from time to time through the Science Advisory Board, task forces or other mechanisms.

[428] Great Lakes Water Quality Board, International Joint Commission, *1989 Report on Great Lakes Water Quality* (Hamilton, Ontario: IJC, October 1989).

[429] Great Lakes Water Quality Board, International Joint Commission, "A Shared Policy Vision for the Great Lakes: A Workshop Report of the Great Lakes Water Quality Board" (June 17–18, 1991).

[430] Great Lakes Water Quality Board, *Cleaning Up Our Great Lakes: A Report from the Water Quality Board to the International Joint Commission on Toxic Substances in the Great Lakes Basin Ecosystem* (Windsor, Ontario: August 1991).

[431] Great Lakes Water Quality Board, International Joint Commission, *1993 Report of the Great Lakes Water Quality Board to the International Joint Commission* (Windsor, Ontario: September 1993).

[432] IJC, "1993–95 Priorities and Progress," Chapter 1.

[433] Confidential interviews.

[434] Interviews of state representatives on WQB by Glenda Daniel.

[435] Terms of Reference for the Joint Institutions and the Great Lakes Regional Office, appended to the 1978 Great Lakes Water Quality Agreement, Section 2.

[436] Nelson Thomas interview.

[437] Science Advisory Board, International Joint Commission, "The Role of the Science Advisory Board" (Conclusions of a Workshop held on November 19, 1991, at Burlington, Ontario, dated January 14, 1992), p. 6. Hereinafter referred to as the "SAB Workshop Report."

[438] Ibid., p. 3.

[439] James R. Ludwig, "Editorial: Science, Research, and Public Policy in the Great Lakes: Making Science Subservient to Politics on IJC Boards," *Journal of Great Lakes Research* 21, no. 2 (1995): 159. This editorial was responded to by Michael Donahue in "Commentary: The IJC and Its Advisory Boards: Setting the Record Straight," *Journal of Great Lakes Research* 21, no. 30 (1995): 405–407.

[440] Gordon Durnil interview.

[441] See Chapter 9 of the *1989 Report of the Great Lakes Science Advisory Board to the International Joint Commission* and Chapter 12 of the *Great Lakes Science Advisory Board 1991 Report to the International Joint Commission*

[442] International Joint Commission, Council of Great Lakes Research Managers, *A Proposed Framework for Developing Indicators of Ecosystem Health for the Great Lakes Region* (Report to the International Joint Commission, Windsor, Ontario, July 1991); Council of Great Lakes Research Managers, *Proceedings of a Workshop on Cause-Effect Linkages* (Held at Chicago, Illinois, March 28–29, 1989). All the papers presented were published in full in a Special Issue of the *Journal of Toxicology and Environmental Health* 33, no. 4 (1991).

[443] Approved by the International Joint Commission, April 9, 1991; Council of Great Lakes Research Managers, "1993 Report to the International Joint Commission" (June 1, 1993). The council's report was included as Chapter 3 in the *1993–95 Priorities and Progress Made Under the Great Lakes Water Quality Agreement* (Windsor, Ontario: IJC, August 1995).

[444] John Gannon interview.

[445] Judith Stockdale interview.

[446] Minutes of the Science Advisory Board meeting, November 19, 1992, Burlington, Ontario, p. 5.

[447] Hilary Cleveland interview.

[448] Virtual Elimination Task Force, "Persistent Toxic Substances: Virtually Eliminating Inputs to the Great Lakes Interim Report" (Windsor, Ontario: IJC, July 1991), p. 6.

[449] Virtual Elimination Task Force, *Persistent Toxic Substances; Report of the Virtual Elimination Task Force to the International Joint Commission, A Strategy for Virtual Elimination of Persistent Toxic Substances* (Windsor, Ontario: IJC, August, 1993).

[450] Jack Weinberg interview.

[451] Terms of Reference for the Joint Institutions and the Great Lakes Regional Office, Section 3(f).

[452] Confidential interviews.

[453] IJC, *Reconstituted Task Force Report*, p. 3.

[454] Ibid., p. 5.

[455] Lee Botts, personal observation.

[456] Don Lajoie, "IJC Backers Hold Rally To Save Windsor Office," *The Windsor Star*, January 24, 1992, p. A3.

[457] Gary Rennie, "Proposed Changes a Threat to IJC, Ex-official Claims," *The Windsor Star*, January 24, 1992, P. A3. See also Paul McKeague, "IJC Stays in Windsor, But Library Has To Go," *The Windsor Star*, February 15, 1992, p. A1.

[458] Gordon Durnil and Hilary Cleveland interviews.

[459] Jean LaForge interview.

[460] Annual attendance figures provided by Great Lakes Regional Office show that attendance grew slowly in the 1970s, increased in the 1980s and exploded from 1989 on.

[461] Lee Botts, personal observation.

[462] Confidential interviews.

[463] Paul Muldoon, personal observation.

[464] Proposal for a Binational Management Framework, an Appendix to the Eighth Meeting of the Parties in Cooperation with State and Provincial Governments under the 1987 Protocol to the 1978 Great Lakes Water Quality Agreement, Summary Record, Chicago, November 19, 1991, p. 1.

[465] International Joint Commission, Indicators for Evaluation Task Force, *Indicators to Evaluate Progress under the Great Lakes Water Quality Agreement* (Windsor, Ontario: IJC, April 1996.

[466] Jane Elder and Mark Van Putten interviews.

[467] The largest national network of such grassroots groups in the U.S. is maintained by the Citizen's Clearinghouse For Hazardous Wastes, Falls Church, VA. This organization was founded by Lois Gibbs who had played a lead role in organizing local residents at Love Canal.

[468] Confidential interview.

[469] Great Lake United, *Unfulfilled Promises.*

[470] Lee Botts, personal observation.

[471] Gordon Durnil, Hilary Cleveland, and Valdas Adamkus interviews.

[472] Valdas Adamkus interview.

[473] David LaRoche interview.

[474] Paul Muldoon, personal observation.

[475] Tim Eder, Wayne Schmidt, Glenda Daniel, and John Jackson interviews.

[476] Gordon Durnil and Hilary Cleveland interviews.

[477] For example, see National Wildlife Federation and the Canadian Institute for Environmental Law and Policy, *A Prescription for Healthy Great Lakes: Report of the Program for Zero Discharge* (Washington, D.C.: National Wildlife Federation, 1991). This report was reflected in the 1991 Water Quality Board report to the International Joint Commission.

[478] Glenda Daniel and John Jackson interviews.

[479] Notes for Remarks by the Honorable Jean Charest, Minister of the Environment at the Biennial Meeting of the International Joint Commission, Traverse City, Michigan, U.S.A., October 1, 1991, pp. 6–8.

[480] "A Citizens' Biennial Review of Canadian and U.S. Government Actions to Protect and Restore the Great Lakes," prepared for the Biennial Meeting of the International Joint Commission, October 21–24, 1993.

[481] Confidential interview.

[482] See "Our Lakes, Our Health, Our Future" (A Presentation to the International Joint Commission, Eighth Biennial Meeting, September 22–25, 1995, Duluth, Minnesota, coordinated by Great Lakes United, Buffalo, New York).

[483] Remarks of T. Baldini, Presentation to Consultation on IJC Consultation processes, October 8, 1996.

[484] A number of commissioners stated this view at the October 8, 1996 consultation on the proposed new IJC's consultation plan held in Detroit, Michigan.

[485] International Joint Commission, "The International Joint Commission and Its Public: Expanding Consultation under the Great Lakes Water Quality Agreement," Discussion Paper, (Washington, D.C.: IJC, September,1996) p. 2.

[486] This view was expressed by industry representatives at an October 8, 1996 consultation on the proposed new IJC's consultation plan held in Detroit, Michigan.

[487] "IJC Cancels Biennial Meeting" by John Jackson, in *Great Lakes United* 10, no. 4 (Fall, 1996): 1.

[488] Paul Muldoon, personal observation.

[489] International Joint Commission, Fifth Biennial Report.

[490] International Joint Commission, Eighth Biennial Report, p. 13.

[491] For instance, the history of the concept is discussed in depth in: National Wildlife Federation and the Canadian Institute for Environmental Law and Policy, *A Prescription for Healthy Great Lakes* (1991).

[492] Alana M. Fuierer, "The Anti-Chlorine Campaign in the Great Lakes: Should Chlorinated Compounds Be Guilty Until Proven Innocent?" *Buffalo Law Review* 43 (1995): 181–229; Durnil, *The Making of a Conservative Environmentalist.*.

[493] The contrasting views of the chlorine issue can be discerned from two appendices to the Report on Virtual Elimination Task Force. See G.N. Werezak, "A Report on Chlorine to the Virtual Elimination Task Force"; D.K. Phenecie, "Virtual Elimination in the Pulp and Paper Industry"; and T. Muir, T. Eder, P. Muldoon, and S. Lerner, "Case Study:

Application of a Virtual Elimination Strategy to an Industrial Feedstock Chemical-Chlorine," in *Three Background Reports to the Virtual Elimination Task Force on the Subject of Chlorine and Organochlorines* (Windsor, Ontario: IJC, April 1993). See also John R. Ehrenfeld, "Science, Scientists and Chlorine: or It's a Wicked World Out There" (Presentation to The Future Uses of Chlorine: Symposium on the Role of the University, Massachusetts Institute of Technology, Cambridge, Massachusetts, November 14–15, 1994).

[494] Gordon Durnil interview.

[495] Jack Vallentyne and Gordon Durnil interviews.

[496] For example, see: *Report of the Great Lakes Science Advisory Board*, 1989 Report, p. 71; Great Lakes Science Advisory Board, *1991 Report to the International Joint Commission*, p. 41.

[497] International Joint Commission, Virtual Elimination Task Force Report.

[498] Craig Waddell, "Saving the Great Lakes - Public Participation in Environmental Policy" in *Green Culture: Environmental Rhetoric in Contemporary America*, Carl G. Herndl and Stuart C. Brown, eds. (Madison: The University of Wisconsin Press, 1996), p. 153.

[499] The IJC is mentioned in virtually every one of the numerous reports concerning a chlorine ban by industry, in scientific journals, or in the general news media. See, for example, Ivan Amato, "Crusade to Ban Chlorine," *Garbage* 6, no. 2 (Summer, 1994): 30–39. Gordon Durnil spoke on the subject at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil.

[500] Great Lakes United, Clean Production Task Force, *Planning for the Sunset: A Case Study for Eliminating Dioxin by Phasing out PVC Plastics* (Buffalo, New York: GLU, May 1995).

[501] The reports from the parties began in 1989: *First Report of Canada under the 1987 Protocol on the 1978 Great Lakes Water Quality Agreement* (Prepared by the Government of Canada and the Government of the Province of Ontario under the 1986 Canada-Ontario Agreement Respecting the Great Lakes Water Quality Agreement, December 1988, released on February 8, 1989); *U.S. Progress in Implementing the Great Lakes Water Quality Agreement: Annex Reports to the International Joint Commission* (Chicago, Illinois: Great Lakes National Program Office, U.S. Environmental Protection Agency, Officially transmitted June 7, 1989). For an example of joint assessment, see Canada and the United States, *State of the Great Lakes* (Ottawa and Washington, D.C.: Environment Canada and the U.S. Environmental Protection Agency, 1995).

[502] Minutes from the Binational Executive Committee Meeting, at Rosemont, Illinois, May 19, 1994.

[503] For example, see "Summary Record of the Eighth Meeting of the Parties in Cooperation with State and Provincial Governments under the 1987 Protocol to the 1978 Great Lakes Water Quality Agreement," November 19, 1991, at Chicago, Illinois.

[504] See "Proposal for a Binational Management Framework. " Minutes from the Binational Executive Committee Meeting, November 19, 1991, p. 2.

[505] See Minutes of the Binational Executive Committee Meeting, May 19, 1994, p. 1.

[506] Binational Executive Committee, "Draft Discussion Paper, Great Lakes Binational Executive Committee: Roles and Responsibilities" (Binational Executive Meeting, March 9, 1995).

[507] See NRC/RSC, *The Great Lakes Water Quality Agreement,* p. 48, for discussion of the differences between the Canada and the U.S. approach to regulation of direct municipal and industrial discharges.

[508] Chris Grundler interview.

[509] Environment Canada and U.S. Environmental Protection Agency, "Canada-United States Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes Basin" (Draft for Consultation, August 1995).

[510] For example, see the letter from Mark Winfield of the Canadian Institute of Environmental Law and Policy to Ron Shimizu of Environment Canada and Chris Grundler of the U.S. Environmental Protection Agency, dated September 25, 1995.

[511] Minutes, Binational Executive Meeting, May 19, 1994, p. 3.

[512] Governments of the United States of America and Canada, *State of the Great Lakes 1995* (Burlington/Chicago: USEPA and Environment Canada, 1995).

[513] Environment Canada & U.S. Environmental Protection Agency, "Nearshore Waters of the Great Lakes," "Impacts of Changing Land Use," "Integration Paper" and "Information and Information Management," Draft background papers for the State of the Lakes Ecosystem Conference '96, Windsor, Ontario, November 6–8, 1996.

[514] International Joint Commission, Indicators for Evaluation Task Force, White Paper, "Indicators to Evaluate Agreement Progress," May 4, 1995.

[515] Indicators for Evaluation Task Force, International Joint Commission, *Indicators to Evaluate Progress under the Great Lakes Water Quality Agreement,*(Ottawa and Washington, IJC April 1996.

[516] In 1993, the "report card" presented to the 1993 biennial meeting by environmentalists was meant to call attention to this gap. See Canada and the United States, *State of the Great Lakes 1995.*

[517] Confidential interviews.

[518] U.S. Environmental Protection Agency, Region 5, and Indiana Department of Environmental Management, Northwest Indiana Environmental Initiative Action Plan, August,1996. EPA 905-R-96-013.

[519] U.S. Environmental Protection Agency, Great Lakes National Program Office, Mining Ideas, Turning a Grant Assistance Program into a Knowledge Base, A Report on the Ecological Protection and Restoration Program in the Great Lakes Basin, April, 1996.

[520] This section is a summary of a report prepared for this project by John Jackson, "The Provinces and the Great Lakes Water Quality Agreement."

[521] The delay in the renegotiation of the COA invoked considerable comment. For a review and commentary, see Royal Commission on the Future of the Toronto Waterfront, *Regeneration: Toronto's Waterfront and the Sustainable City: Final Report* (Toronto: Royal Commission, 1992), pp. 142–143.

[522] Ontario estimated that it was putting $145 million each year into Great Lakes programs (letter from Ontario Environment Minister Bud Wildman to Federal Government Minister Jean Charest, May 27, 1993) while the federal government was spending $55 to $60 million.

The issue of who would pay for infrastructure improvements was similarly controversial. Almost $1.5 billion of the total estimated $2.5 billion expenditures for needs anticipated

under a revised COA were to cover costs for upgrading sewage treatment plants and control combined sewer overflows. See John Jackson, "The Provinces and the Great Lakes Water Quality Agreement."

[523] The federal government's refusal to contribute to infrastructure costs was discussed in the letter from Ontario Environment Minister Bud Wildman to Federal Environment Minister Jean Charest dated May 27, 1993.

[524] F. Inscho and M. Durfee, "The Troubled Renewal of the Canada-Ontario Agreement Respecting Great Lakes Water Quality," *Publius: Journal of Federalism* 25, no. 1 (Winter 1995): 5961.

[525] Ibid., pp. 62–63.

[526] The differences in the most recent COA include:

> Inclusion of an Ecosystem Perspective: The new COA was broadened to address "human and ecosystem health," with goals for conservation and protected areas, fish and wildlife conservation, climate change, and land and water use management. Measurable targets are also set, such as removing of nine areas from the AOC list by 2000 and seeking a 90 percent reduction in use, generation, and release of seven priority substances by 2000. One negotiator noted that the new COA "reflects a maturing relationship between the federal and provincial governments because they now bring common resources to the COA" (Interview with Ken Richards, July 13, 1995).

[527] Unlike other COAs, the new COA established that both levels of government are responsible for achievement of the GLWQA objectives, with the phrase "Canada and Ontario agree to" throughout the document.

[528] The central theme of past COAs was a money transfer from the federal to the provincial government. The new COA has a three-paragraph "Financial Implications" section that states that the costs of implementing the COA will be $2.5 billion for Canada, Ontario, and the municipal government. This is followed by a statement that the governments will "contribute equitably to meeting the objectives of this Agreement." There are no promises by the federal government to transfer any funds to the province (The Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem, 1994), p. 8–9.

[529] Province of Quebec and Environment Canada, *St. Lawrence Vision 2000: An Action Plan to Conserve and Protect the St. Lawrence and Its Environment.* (The Queen's Printer: Ottawa, 1993).

[530] This section is based on Neely Law and John Jackson, "A Report on the Remedial Action Plan Process in the Great Lakes" (Prepared for the Great Lakes Governance Project of Dartmouth College, March 1996).

[531] J.H. Hartig, and M.A. Zarull, eds., *Under RAPs: Toward Grassroots Ecological Democracy in the Great Lakes Basin* (Ann Arbor, Michigan.: University of Michigan Press, 1992).

[532] J.H. Hartig, *Practical Steps to Implement an Ecosystem Approach in Great Lakes Management*, Proceedings of Workshop in November, 1994 (USEPA and Environment Canada with the IJC and Wayne State University: Windsor, Ontario: 1995).

[533] Law and Jackson, "A Report on the Remedial Action Plan Process," p. 16.

[534] Tim Brown, Lake Michigan Forum. Martin Visnosky, Lake Erie Forum. Tim Bendig, Lake Ontario Forum. Personal communications, at SOLEC 96.

[535] United States Environmental Protection Agency, Great Lakes National Program Office: Lake Michigan Forum Lakewide Work Plan, 1996–1998, November, 1996.

[536] Ibid., p. 2.

[537] Ibid., p. 6. Like the earlier Green Bay Mass Balance Study whose techniques are being used for the larger scale whole lake program, the Lake Michigan Mass Balance Study is intended to identify and quantify all sources of toxic contaminants into the lake and how they are cycled within the ecosystem. The purpose is to help set priorities for control measures.

[538] Environment Canada and U.S. Environmental Protection Agency, "Information and Information Management," Draft Background Paper, State of the Lakes Ecosystem Conference '96, Windsor, Ontario, November 6–8, 1996, p. 46.

[539] Letter signed by Patrick R. Ralston, chair of the Great Lakes Commission , that accompanied the Ecosystem Charter document when it was released in December 1994.

[540] Letter to Michael Donahue, Executive Director, Great Lakes Commission, signed by representatives of Great Lakes United, the Lake Michigan Federation, Sierra Club, National Audubon Society, Citzizens for a Better Environment and Northwatch, June 10, 1994.

[541] Michael Donahue, personal communication.

[542] David LaRoche and Gordon Durnil interviews.

[543] Confidential interview.

[544] Botts, "The Breath of a Child or the Wind of Change."

[545] P. Bertram, M. Neilson, S.L'Italien, V. Glumac, D. Williams, "Nutrients, Trends and System Response" (Background paper prepared for the 1994 State of the Lakes Ecosystem Conference, co-sponsored by Environment Canada and the U.S. Environmental Protection Agency, Dearborn, Michigan, October 1994), EPA 905-D-94-001d. See also D.M. Dolan, "Point Sources Loadings of Phosphorus to Lake Erie, 1986–1990," Journal of Great Lakes Research 19, no. 2 (1993): 200–211.

[546] Botts, "The Breath of a Child or the Wind of Change," p. 12.

[547] Fitzhugh Green speech.

[548] International Joint Commission, *Phosphorus Management for the Great Lakes* (Final Report of the Phosphorus Management Strategies Task Force to the International Joint Commission's Great Lakes Water Quality Board and the Great Lakes Science Adivosry Board, Windsor, Ontario: IJC, July 1980), pp. 64–66.

[549] NRC/RSC, *The Great Lakes Water Quality Agreement*, p. 105. See also Lynton K.: Caldwell, "Implementing an Ecosystems Approach," in *Perspectives on Ecosystem Management*..

[550] Revised Great Lakes Water Quality Agreement of 1978.

[551] Environment Canada and the U.S. Environmental Protection Agency, "Toxic Contaminants" (Background Paper for the State of the Lakes Ecosystem Conference (Chicago, Illinois: USEPA. August 1995), EPA 905-R-95-016.

[552] For example, see: Presentation by Vic Buxton, Transboundary Air Branch, "International Initiatives Related to Hazardous Air Pollutants" at the Workshop by the National Air Issues Coordinating Committee: Hazardous Air Pollutants, held on April 25–

26, 1996, in Hull, Quebec, where the Toxic Substance Management Policy is seen as a means to provide a leadership role in interntional initiatives.

[553] See: H.A. Regier, "Progress with Remediation, Rehabilitation and the Ecosystem Approach," *Alternatives* 13, no.2 (1986): 46–54

[554] William K. Reilly, "Aiming Before We Shoot: The 'Quiet Revolution' in Environmental Policy," Address to the National Press Club, Washington, D.C., September 26, 1990.

[555] Jane Elder, "The Big Picture: The Sierra Club's Critical Ecoregions Program," *Sierra Club Magazine* 79, no. 2 (March–April 1994): 52.

[556] The first report for a LAMP was the Lake Michigan Lakewide Management Plan, published by Region 5, USEPA, in draft form on January 1, 1992. In 1996, the agency began a lakewide mass balance study designed to provide comprehensive data about the sources and loadings of toxic contaminants that will provide the basis for a detailed toxics reduction strategy.

[557] Mark Reshkin interview.

[558] Botts, "The Breath of a Child or the Wind of Change."

[559] NRC/RSC, *The Great Lakes Water Quality Agreement.*

[560] Botts, "The Breath of a Child or the Wind of Change."

[561] National Wildlife Federation, *Cutting the Poisons: Estimated Reductions in Point Source Loadings of Great Lakes Toxic Pollution from the Great Lakes Water Quality Initiative* (Ann Arbor, Michigan: National Wildlife Federation, Great Lakes Natural Resource Center, May 11, 1993).

[562] Sullivan and Bixby, *A Citizens Guide for Cleaning Up Contaminated Sediment*; U.S. General Accounting Office, *Water Resources: Future Needs for Confining Contaminated Sediment in the Great Lakes Region* (Report to the Chairman, Subcommittee on Water Resources, Committee on Public Works and Transportation, House of Representatives, July 1992).

[563] The goal of the MISA program is the "virtual elimination of toxic discharges," which, one can presume, emanates from the language in the GLWQA. See Ministry of the Environment, *A Policy and Program of the Government of Ontario on Controlling Municipal and Industrial Discharges into Surface Waters* (Toronto: Ministry of the Environment, June 1986), p. 7.

[564] One of the dominant themes in the new policy is to "virtually eliminate" the release of certain persistent toxic chemicals. See Government of Canada, Toxic Substances Management Policy (Ottawa:June 1995).

[565] It could be argued that the recognition of the need to phase out some persistent toxic chemicals in the federal government's proposal to amend the Canadian Environmental Protection Act stems directly from the work within the Great Lakes. See Chapter 9 in Government of Canada *CEPA Review.*

[566] Clyde W. Sweet, "International Monitoring of the Deposition of Airborne Toxic Substances to the Great Lakes" (Proceedings of the 9th World Clean Air Congress, Montreal, August 30–September 2, 1992).

[567] Province of Quebec and Environment Canada, *St. Lawrence Vision 2000.*

[568] International Joint Commission, *Seventh Biennial Report*, p. 40.

[569] Thomas Heidtke, William Sonzogni, and Lee Botts, *Great Lakes Environmental Planning Sutdy: Summary Report* (Ann Arbor, Michigan: Great Lakes Basin Commission, September, 1981).

[570] NRC/RSC, *The Great Lakes Water Quality Agreement.*

[571] The Lake Michigan Mass Balance Study is part of the Lake Michigan LAMP. For critical details, see Thomas J. Murphy, "The U.S. EPA and Science in the Great Lakes," *Journal of Great Lakes Research* 22, no. 1 (1996): 1–4.

[572] See Robert Spencer, John Kirton, and Kim Richard Nossal, *Seventy Years On.* See also, University of New Mexico School of Law, "The North American Experience Managing International Transboundary Water Resources: The International Joint Commission and the International Boundary Waters Commission," *Natural Resource Journal* 33 no. 2 (Spring 1993); and Caldwell, *Perspectives on Ecosystem Management.*

[573] Valdas Adamkus interview.

[574] See Part 3.

[575] Freshwater Society for the Center for the Great Lakes, *The Great Lakes Directory of Natural Resource Agencies and Organizations* (Chicago: Center for the Great Lakes, 1984).

[576] Princen and Finger, *Environmental NGOs in World Politics.*

[577] International Joint Commission, *Pollution of Lake Erie, Lake Ontario and the International Section of the St. Lawrence River.*

[578] Walter A. Rosenbaum, *The Politics of Environmental Concern* (New York, Washington, and London: Praeger Publishers, 1973).

[579] Phil Weller, *Fresh Water Seas: Saving the Great Lakes* (Toronto, Ontario: Between the Lines, 1990).

[580] Lee Botts, personal observation.

[581] Lee Botts, personal observation.

[582] Glenda Daniel interview.

[583] Jane Elder interview.

[584] Great Lakes United, *Unfulfilled Promises.*

[585] Jackson, "The Negotiation of the 1987 Protocol."

[586] Gordon Durnil and Hilary Cleveland interviews.

[587] See Part 3.

[588] Presentations in the public comment section of the September, 1995, biennial meeting in Duluth were made by representatives of industry, an enviornmental coalition, labor and First Nations or Native Americans, and included a group of school children who sang a song.

[589] Henry Lickers, personal communication.

[590] Jane Elder interview.

[591] Institute for Conservation Leadership and the Environmental Support Center, *Great Lakes/Great Stakes: The Environmental Movement in Reflection* (Washington, D.C., 1996).

[592] Lee Botts and Paul Muldoon, personal observations.

[593] Lee Botts, personal observation.

[594] Environment Canada and U.S. Environmental Protection Agency, *Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes Basin.*

[595] Colborn, et al., *Great Lakes, Great Legacy.*

[596] See International Joint Commission, *Great Lakes Science Advisory Board 1993 Report to the International Joint Commission* (Windsor, Ontario: IJC, October 1993) for a historical overview of how the toxic contamination issue has been addressed during the life of the GLWQA.

[597] The role of research is described in a summary of results of *A Public Forum on the Future of Great Lakes Science* organized by John Gannon and John Hartig at the 1995 Biennial IJC meeting in Duluth. Published in the *Lakes Letter* 27, no. 1 (April 1996) (Ann Arbor, Michigan, International Association of Great Lakes Research).

[598] The 1994 annual report of the Great Lakes Protection Fund states that the mission is to support projects that "identify, demonstrate and promote regional action to enhance the health of the Great Lakes ecosystem." (Chicago, Illinois: Great Lakes Protection Fund, 1994).

[599] For example, James Ludwig's research on the effects of toxic contaminants in birds is carried out through a private company he operates.

[600] "Commentary: Reduction of Funds for Great Lakes Science: Results of November 1995 Research Budget Summary," *JournaL of Great Lakes Research* 22, no. 2 (1990). The most recent research inventory by the CGLRM is on the Great Lakes Information Network on the Internet.

[601] According to Article 10(4), the GLWQA is to be reviewed after every third biennial meeting. The next review is due in 1999.

[602] See the discussion of changes in the 1978 Agreement in Part 3.

[603] Article 10(3) of the 1987 Agreement directs the parties to meet twice a year to coordinate work plans and evaluate progress.

[604] See Section 2(c)(i) Specific Objectives Supplement to Annex 1 of the Great Lakes Agreement with the 1987 Protocol.

[605] See the discussion in Part 3.

[606] Terms of References for the Joint Institutions and the Great Lakes Regional Office, 3(b)(ii).

[607] Buses were chartered only for the 1983 meeting in Indianapolis.

[608] At a July 31, 1996, meeting in Chicago, the BEC voted to extend observer status to anyone who asked for it, in response to a request from the Great Lakes Commission.

[609] General Accounting Office reports related to the Agreement are listed in End Note 80.

[610] For example, witnesses to hearings on the adequacy of Great Lakes research programs by the Subcommittee on Investigations and Oversight of the Commitee on Public Works and Transportation, U.S. House of Representatives, March 3, 1987, included Peter Wise, then Director of the Great Lakes National Program Office of USEPA and Alan R. Thomas, Deputy Assistant Administrator for Oceanic and Atmospheric Research, National Oceanographic and Atmospheric Agency.

[611] The position of the Great Lakes Water Quality Coalition against the proposed Great Lakes Water Quality Initiative was spelled out in an undated position paper about 1992 when the organization's headquarters was located in Cleveland, Ohio. This paper is in the files of the Lake Michigan Federation in Chicago, Illinois.

[612] Environment Canada, U.S. Environmental Protection Agency, Nearshore Waters of the Great Lakes, Background Paper, State of the Lakes Ecosystem Conference, November, Windsor, Ontario, November 6–8, 1996.

[613] K.H. Nicholls and G.J. Hopkins, "Recent Changes in Lake Erie (North Shore) Phyoplankton: Cumulative Impacts of Phopshorus Loading Reductions and the Zebra Mussel Introduction," *Journal Great Lakes Research* 19, no. 4 (1993): 637–647.

[614] See *Journal of Great Lakes Research* 21, no. 4 (1995). The Special Section on Zebra Mussels in the Saginaw Bay, Lake Huron Ecosystem contains eleven articles on the history of colonization and effects of zebra mussels.

[615] SOLEC 96 Background Paper on Nearshore Waters of the Great Lakes, p. 119.

[616] Jane Elder interview.

[617] Review is required following every third biennial report of the IJC to the governments. In 1993, the IJC and the governments agreed to continue the agreement as it was amended by the 1987 protocol.

[618] International Joint Commission, *Eighth Biennial Report*, p. 3.

[619] *Wall Street Journal*, March 5, 1996, "Environmental Stands Alienate Some Backers of the GOP's Agenda."

[620] Mike Quigley, "Editorial: The Best and Worst of Times," *Journal of Great Lakes Research* 21, no. 4 (1995): 409.

[621] Barry G. Rabe and Janet Zimmerman, "Regime Emergence in the Great Lakes Basin," *International Environmental Affairs* 7, no. 4 (Fall 1995).

[622] Mark van Putten, founder and director of the National Wildlife Federation's Great Lakes Resources Center, became president of the National Wildlife Federation in 1996. Jane Elder, founder and director of the Sierra Club's Great Lakes Program, became head of the national Biodiversity Consortium.

[623] The Commission for Environmental Cooperation is a trilateral agency that involves Mexico as well as the parties to the Great Lakes Water Quality Areement and was established under the environmental side agreement to the North American Free Trade Agreement of 1994.

[624] Confidential interviews.

[625] John Gannon and John Hartig, *A Public Forum on the Future of Great Lakes Science--A Summary*, Held at the IJC Biennial meeting on September 24, 1995, Duluth, Minnesota. See Endnote 597 for a published version of the summary that was distributed afterwards.

[626] International Joint Commission, "The International Joint Commission and its Publics: Expanding Consultation under the Great Lakes Water Quality Agreement," News Release, Washington, D.C., and Ottawa, November 15, 1996.

APPENDIX 1: INTERVIEW OUTLINE AND PERSONS INTERVIEWED OR CONSULTED

Interview Outline

THE GREAT LAKES WATER QUALITY AGREEMENT PROJECT
INSTITUTE FOR INTERNATIONAL ENVIRONMENTAL GOVERNANCE
DARTMOUTH COLLEGE

The purpose of the Great Lakes Water Quality Agreement Project is to review and evaluate experience to date under this binational regime and to develop recommendations for its future. The project is sponsored by the Institute for International Environmental Governance of Dartmouth College and is supported by grants from the Gund, Mott, Joyce, and Laidlaw Foundations and the U.S. Environmental Protection Agency.

The project manager is Konrad von Moltke and the principal investigators are Paul Muldoon in Canada and Lee Botts in the United States. An advisory committee represents participants and interests in implementation of the agreement, including government, academia, industry, and environmental organizations.

The Great Lakes Agreement project will rely heavily on interviews of many participants in the agreement processes from government, academia, and research agencies, industry, and nongovernmental organizations. In addition to interviews, documents may be reviewed that include historic accounts of the IJC, the Boundary Waters Treaty, and the Water Quality Agreement, official IJC and government reports, and commentary by nongovernmental organizations (NGOs) and academic experts.

Draft findings and conclusions from results of evaluation will be submitted for comment to the project advisory committee and persons interviewed before being finalized. A series of meeting will be held to present findings and conclusions to interested parties as the project proceeds.

A final report on results will be written in a form suitable for adaptation and publication as a book. The expected audience for the report will include participants under the agreement and persons interested in international environmental management.

More information can be obtained from the following sources:

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FROM: Paul Muldoon (416-960-2284) and Lee Botts (219-938-2863
Great Lakes Water Quality Agreement Project
Institute for International Environmental Governance
Dartmouth College

QUESTIONS ON IMPLEMENTATION OF THE GREAT LAKES WATER QUALITY AGREEMENT BETWEEN CANADA AND THE UNITED STATES

The questions listed below will be addressed in the Great Lakes Water Quality Agreement project. They will be considered in review of documents, official reports, and published literature. They will also be sent to persons who have been involved in implementation of the agreement in advance of personal interviews.

I. ORIGINS OF THE AGREEMENT
- A. How did the concept originate for the Great Lakes Water Quality Agreement?
- B. What unique ecological, political, or other factors influenced development of the 1972 agreement?
- C. What were the expectations of the original agreement and why have they been met or not met?

II. HOW THE AGREEMENT WAS DEVELOPED
- A. Who were the main participants in its development?
- B. What was the relationship between individual leadership, government policies, and scientific concerns in the negotiation?
- C. Was there any direct participation from outside government, such as by nongovernmental organizations or industry?

III. INSTITUTIONAL ARRANGEMENTS FOR THE AGREEMENT
- A. Was the agreement intended to apply the principles of the Boundary Waters Treaty?
- B. How were the institutional arrangements determined within the IJC for the Great Lakes Agreement (advisory boards, the regional office, requirements for public information, progress reports to the governments, ongoing research, and periodic review of the objectives?
- C. Were other models considered for the binational regime?

IV. THE 1978 AGREEMENT
- A. Who participated in the review and negotiation of the new agreement in 1978?
- B. What was the basis for emphasis on control of toxic contaminants in the revised agreement of 1978?
- C. How did the concept of "virtual elimination," "zero discharge," and "ecosystem approach to management" come to be included in 1978?

V. THE 1987 PROTOCOL
- A. How was the 1987 protocol developed and what was the role of nongovernmental organizations?
- B. What was the purpose of the language of the 1987 protocol concerning the role of the parties?
- C. What changes were expected with the 1987 protocol (1) for the IJC, (2) for the parties, and (3) for the role of the public?

VI. IMPLEMENTATION OF THE GREAT LAKES AGREEMENT

A. How have the operations and role of the IJC itself changed with experience over time under the Great Lakes Agreement?

B. What adaptations have occurred during 25 years of experience in the role of the advisory boards, the role of governments, and involvement of the public?

C. Has the fundamental goal of clean up of the Great Lakes been achieved with implementation of the agreement?

VII. RESULTS OF THE GREAT LAKES WATER QUALITY AGREEMENT TO DATE

A. What are the greatest successes and greatest failures of the agreement and what explains these results?

B. Has more clean up and protection of the Great Lakes occurred because of the agreement than would have been accomplished without it?

C. Have there been any unexpected results of the agreement?

VIII. THE FUTURE OF THE GREAT LAKES WATER QUALITY AGREEMENT

A. What are the greatest challenges for the future of the agreement?

B. What changes should be made to improve achievement of the goals of the agreement?

C. Does the Great Lakes Agreement provide a model for environmental management across other international borders, and if so, how?

IX. THE GREAT LAKES AGREEMENT PROJECT

A. Is this project addressing the right questions for evaluation of results of the Great Lakes Agreement? Please suggest other issues or questions that should be addressed.

B. What sources of information should be used for this project? Please list names of persons who should be interviewed and documents or published literature that should be reviewed.

C. What should be done with the documented findings and conclusions of this project?

Persons Interviewed or Consulted

Valdas Adamkus, George Alexander, Jim Barnes, Elise Beam, Elaine Kaplan Beck, Alfred Beeton, Tim Bendig, Paul Bertram, Pat Bonner, Peter Boyer, Marty Bratzel, Murray Brooksbank, Tim Brown, James Bruce, Dale Bryson, Kelly Burch, Lynton K. Caldwell, Allegra Cangellosi, Jim Chandler, Peter Christich, Hilary Cleveland, Theo Colborn, Sally Cole-Misch, William Cooper, Glenda Daniel, Terry Davies, Bill Davis, Michael Donahue, Gordon Durnil, Tim Eder, Jane Elder, Mark Elster, George Francis, Kent Fuller, John Gannon, Michael Gilbertson, Walter Giles, Chris Grundler, David Hales, Andrew Hamilton, Jim Hanlon, Jean Hennessey, Pat Hill, Paul Horvatin, Ava Hottman, John Jackson, Conrad Kleveno, Eleanor Kulin, Jean LaForge, David LaRoche, Sheila Leahy, Richard Liroff, Carri Lohse-Hanson, Orie Loucks, Jim Ludwig, Jack Manno, Tom Martin, Joyce McClean, John McDonald, Madonna McGrath, Doug McTavish, Tracy Mehan, Don Mount, Don Munton, Tom Murphy, Jim Park, Dale Phenecie, Kathy Prosser, Mike Quigley, Del Rector, Eric Reeves, Henry Regier, William Reilly, Mark Reshkin, Ken Richards, David Rockwell, Charles Ross, Vacys Saulys, Wayne Schmidt, Duane Schuepelz, Ron Shimizu, Bob Slater, William Steggles, Judith Stockdale, Wayland Swain, Nelson Thomas, Rich Thomas, Bob Tolpa, Jack Vallentyne, Mark Van Putten, Martin Visnosky, Jack Weinberg, Lyman Wible, and Peter Wise.

APPENDIX 2: REPORTS UNDERTAKEN FOR THIS PROJECT

Paul Botts, "The Breath of a Child, or the Wind of Change? Assessing the Impact of the Great Lakes Water Quality Agreement on Nutrient and Toxic Pollution of the Great Lakes" (March 1996).

Glenda Daniel, "The Great Lakes Water Quality Agreement: A State Perspective" (December 1995).

John Jackson, "The Provinces and the Great Lakes Water Quality Agreement" (December 1995).

John Jackson, "Lake Superior and the Great Lakes Water Quality Agreement" (March 1996).

Neely Law with the assistance of John Jackson, "A Report on the Remedial Action Plan in the Great Lakes" (March 1996).

Marcia Valiante, "Preliminary Summary of Findings Concerning the Great Lakes Constituency" (1995).

APPENDIX 3: GLOSSARY

Annex. A section appended to the Great Lakes Water Quality Agreement on a specific topic.

Area of Concern. An area identified by the IJC where failure to achieve objectives of the Great Lakes Water Quality Agreement has resulted in impairment of one or more 14 beneficial uses.

Atmospheric Deposition. Deposit of pollutants from the atmosphere, through vapor exchanges, in the form of dust or in rain or snow.

BEC. Binational Executive Committee, with members from federal agencies, who meet twice yearly to coordinate work plans and review progress under terms of the 1987 Protocol.

Binational. An institution or activity in which representatives of two countries serve the joint interests rather than the interests of the separate nations.

Bioaccumulation. Sequestration of metals or chemicals in living tissue, such as PCBs in fatty tissue, that increases over time with continued exposure.

CGLRM. Council of Great Lakes Research Managers, an advisory board whose members represent agencies or institutions involved in Great Lakes research that was established by the IJC to assist implementation of the Great Lakes Water Quality Agreement.

Contaminated Sediments. Particles of matter on the bottoms of water bodies that contain toxic contaminants.

Critical Pollutants. A list of pollutants identified by the Water Quality Board of the IJC for zero discharge and virtual elimination.

DDT. Dichloro-diphenyl-trichloroetane, a persistent pesticide whose use for most purposes has been banned in Canada and the United States.

Diversion. Transfer of water from one watershed to another.

Drainage Basin. A body of water and the land that drains into it.

Ecosystem. The system of relationships between living organisms and the place, or environment, that they inhabit, including humans.

Ecosystem Approach. A concept that considers considers effects on the relationship between organisms and their environment in an ecosystem, rather than on a single medium such as air, water or land.

Effluent. Waste water discharged from industrial and municipal sewage treatment plants.

Eutrophication. The status of a body of water where increase of minerals and organic nutrients favors growth of plants.

Exotic Species. Species that are not native to an ecosystem but are present because of deliberate or accidental introduction.

Great Lakes Regional Office. The office established under the Great Lakes Water Quality Agreement to assist in coordination for implementation.

GLU. Great Lakes United, a binational environmental organization in the Great Lakes basin.

Great Lakes Basin. The geographic area in Canada and the United States that drains into the Great Lakes.

Great Lakes Basin Ecosystem. The ecosystem within the drainage basin of the Great Lakes and the St. Lawrence River, upstream from the international boundary between Canada and the United States.

IJC. The International Joint Commission of the United States and Canada, established under the Boundary Waters Treaty of 1909 as an independent agency.

Integrity. "When the physical, chemical and biological components of the waters of the Great Lakes Basin Ecosystem are maintained and restored in an unimpaired condition" (IJC 8th Biennial Report).

LAMPS. Lakewide Management Plans, which are to be developed by the governments for each of the Great Lakes to reduce loadings of critical pollutants and restore beneficial uses.

Limiting Nutrient. The critical nutrient that triggers algae growth as a sign of accelerated eutrophication, which is phosphorus in the Great Lakes.

NGO. A person or an institution that is not an official part of a government.

Nonpoint Source Pollution. A source of pollution where pollutants reach waterways from a wide area or from many small sources rather than a distinct identifiable source.

Parties. The governments that are signatories to the Great Lakes Water Quality Agreement or the agencies that represent them in implementation processes.

PCBs. Polychlorinated biphenyls, a class of persistent organic chemicals that bioaccumulate.

Persistent Bioaccumulative Contaminants. Toxic contaminants that both do not decompose readily and bioaccumulate in living tissues and can affect the wellbeing of living organisms. As defined in the Great Lakes Water Quality Agreement, a chemical with a half life of over eight weeks.

Point Source Pollution. A distinct identifiable source from which pollution is discharged, such as a discharge pipe.

Regime. The interacting participants and institutions that interact under an international agreement in accordance with accepted rules or values.

Reverse Onus. A requirement that the user or discharger of a pollutant be required to demonstrate that the substance does not damage the health or wellbeing of living organisms.

SAB. Science Advisory Board, one of two advisory boards to the IJC called for in the Great Lakes Water Quality Agreement of 1972, with members appointed by the commission.

Sunsetting. A process leading to ban on use of a persistent toxic substance.

Toxic Contaminants. Substances that adversely affects the health or well-being or any living organisms.

Transition. "A process led by governments and involving all economic sectors to plan and implement a strategy to modify production and consumption practices at inidividual, societal and global scales over a reasonable time period, in order to achieve a more environmentally and humanly sustainable economy." (IJC 8th Biennial Report)

Virtual Elimination. "An Agreement commitment by Canada and the United States to virtually eliminate the input of persistent toxic substances, in order to protect human health and to ensure the continued health of the Great Lakes Basin Ecosystem" (IJC 8th Biennial Report).

Weight of Evidence. "A decisionmaking approach that takes into account the cumulative body of evidence, scientific and otherwise, with the extent of the potential consequences, to reach a conclusion on the need for action against environmental contaminants" (IJC 8th Biennial Report).

WQB. Water Quality Board, one of two advisory boards to the IJC called for in the Great Lakes Water Quality Agreement of 1972 whose members include heads of agencies responsible for water quality in the provinces, states and both federal governments.

Zero Discharge. "The Agreement philosophy committed to by Canada and the United States to control inputs of persistent toxic substances that will lead to virtual elimination" (IJC 8th Biennial Report).

APPENDIX 4: ABBREVIATIONS

AOC	Area(s) of Concern
BEC	Binational Executive Committee
BOC	Binational Operations Committee
CCIW	Canadian Centre for Inland Waters
CEC	Commission on Environmental Cooperation (for North America)
CEPA	Canadian Environmental Protection Act
CGLRM	Council of Great Lakes Managers
COA	The Canadian-Ontario Agreement
CLEO	Canadian federal Great Lakes Environmental Office
GLERL	Great Lakes Environmental Research Laboratory
GLI	Great Lakes Initiative
GLIN	Great Lakes Information Network
GLISP	Great Lakes International Surveillance Plan
GLNPO	Great Lakes National Program Office
GLU	Great Lakes United
GLWQA	Great Lakes Water Quality Agreement
IADN	Integrated Atmospheric Deposition Network
IAGLR	International Association of Great Lakes Research
IJC	International Joint Commission
IRPP	Institute for Research on Public Policy
LAMPS	Lakewide Management Plans
MISA	Municipal Industrial Strategy for Abatement (Ontario water quality regulatory program)
MUCC	Michigan United Conservation Club
NACEC	North American Commission on Environmental Cooperation
NAFTA	North American Free Trade Agreement

NGOs	Non-governmental Organizations
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge System
NRC	National Research Council
NTA	Nitrilotracetic Acid
PLUARG	Pollution from Land Use Activities Reference Group
POPs	Persistent organic pollutants
RAB	Research Advisory Board, later the SAB (Science Advisory Board)
RAPs	Remedial Action Plans
RSC	Royal Society of Canada
SAB	Science Advisory Board
SOLEC	State of the Lakes Ecosystem Conference
U.S.	United States
USEPA	U.S. Environmental Protection Agency
WQB	Water Quality Board
WWW	World Wide Web

APPENDIX 5: GOVERNANCE OF INTERNATIONAL WATERS: LESSONS FOR THE GREAT LAKES REGION

1. Introduction: Governance of Large Lakes and International Waters

Large lakes and international river basins do not require a global regime. Nevertheless, they frequently require international regimes to address regional concerns within the river basin or lake ecosystem.

Water management is a vital function of governance and much water management is in fact international. Water is critical for human consumption, for agriculture, and for industrial purposes, so that control of the resource has significant economic and security implications. The Rhine, for example, is vital to the human welfare and the economic well-being of Germany and the Netherlands, and important to the other riparian states (Austria, Switzerland, and France). Control of the water is fundamental for these countries and has rendered cooperation much more difficult than might be expected. In arid regions such as the Near East, parts of Asia, and the Western region of North America, water rights determine which land is productive and which is not. Hardly anything matches the importance of water.

It is not generally appreciated how extensive the phenomenon of international river basins is. There are thirteen river basins involving five or more nations (Danube, Niger, Nile, Zaire, Rhine, Zambezi, Amazon, Mekong, Lake Chad, Volta, Ganges-Brahmaputra, Elbe, La Plata—by number of countries in descending order). Fifty countries have 75 percent or more of their territory in international river basins (among them Czech Republic, Hungary, Slovak Republic, Romania, Belgium, Poland, Afghanistan, Gambia, Iraq, Sudan, Ethiopia, Germany, Bulgaria, Peru, Togo, Ghana). Worldwide there are 215 international river basins that cover 47 percent of the land area.[1] No region of the world is exempt from controversies between countries over water, and these are liable to escalate as water demand increases.[2]

Many of these river basins include lakes that are almost by definition international in nature. Indeed, almost all large lakes of the world lie astride international frontiers or in river basins that are international in character. However, large lakes present particular management problems that distinguish them sharply from the needs of river basin management. Consequently, international lakes in international river basins frequently have a management regime of their own. Large lakes require special management systems because of their surface and the residence time of water, the potential for accumulation of pollutants, and the differences in fauna and flora. They typically define an ecosystem in which they form the centerpiece.

The Great Lakes of North America are the largest freshwater ecosystem on the planet. While Great Lakes governance involves only two nations, it represents an extended geographical area within which large numbers of jurisdictions are found. If one includes the states and provinces, the Great Lakes involve nine significant jurisdictions in addition to the national governments (ten with Quebec), entailing a degree of complexity that can match the pattern of river basins such as the Danube. In reality, Great Lakes governance resembles governance of some ocean ecosystems more than that of any other freshwater lake system. It particularly resembles the oceans surrounding continental Europe, which display a comparable density of industrial activities and an even higher density of human population: the Mediterranean, the North Sea, and the Baltic. It is necessary to turn to the regimes governing these waters to derive some lessons that may be applicable to the Great Lakes.

1.1 The North Sea

The North Sea regime—covering the ocean segment bounded by continental Europe, the British Isles, and Scandinavia—is the most highly developed management regime for a marine ecosystem. It has grown out of a traditional intergovernmental structure and now involves numerous actors in addition to the original high level representatives of the administrations of riparian states. The evolution of the North Sea regime is closely linked to its opening to include both nongovernmental actors and high level politicians.

The North Sea regime originated in 1972 with the Oslo Convention, which covers a larger area than the North Sea, extending into the North Atlantic.[3] The Oslo Convention was a traditional international agreement that contained modest initial obligations for the participants and established an institutional mechanism—the Oslo Commission, based in London—to provide administrative support for the meetings of the parties. There are strong similarities between the Oslo Convention and the original Great Lakes Water Quality Agreement (GLWQA); neither envisaged the complexity of the issues to be addressed and consequently remain within a very traditional structure of intergovernmental cooperation. The most important difference, albeit one that sets both regimes on dramatically different paths, lies in the existence of an independent institutional framework in North America, the International Joint Commission (IJC). From the outset, the IJC provided the GLWQA with an independent voice, whereas the Oslo Commission was composed of intermediate-level government officials from the parties, comparable in many ways to the mechanism set up by the Air Quality Agreement between Canada and the United States.

During the initial phase of the Oslo Convention, parties were represented by bureaucrats who were bound by instructions from their governments. The secretariat staff remained limited. Public accountability was also limited to the periodic publication of reports. The Convention made no provisions for public meetings. Indeed, it is doubtful that the drafters considered any such occurrence, so they neither advocated nor opposed it.

The underlying assumption of the Oslo Convention was that the parties would undertake necessary measures to protect the North Sea and that the Convention was needed to ensure that these measures were adequately coordinated and that essential information concerning the North Sea could be shared between the parties. The Oslo Convention introduced new agreed rules on the dumping of waste at sea; that is, on the direct discharge of pollutants to the ocean from ships. Initially, neither dumping of waste nor incineration of hazardous wastes were banned; only the dumping of wastes containing certain substances listed in annexes to the Convention was controlled, with a "Black List" of substances that were prohibited and a "Gray List" of substances that triggered a need for special licensing regimes in each country.

The North Sea regime was the forerunner of numerous comparable regimes for other "regional seas," including the Mediterranean, the Baltic, and the Caribbean. Each of these regimes has evolved differently, however, reflecting particular political and environmental circumstances. The history of the North Sea regime has been one of repeated adjustments, as evidence continued to mount that more efforts were needed to protect the ecosystem than most individual parties were anticipating.

Like other large water ecosystems, most pollutants reaching the North Sea do so indirectly, through rivers that discharge into the North Sea or through atmospheric transport. The original Convention dealt only with incineration at sea and the intentional dumping of wastes from ships, although it envisaged a further agreement to address land-based pollution. This was concluded two years later and became known as the Paris Convention.[4] The Paris Convention was again a pioneering effort to codify the complex realities of marine pollution with traditional instruments of international law. The parties to the Paris Convention were the same as those for the Oslo Convention, except that the European Community was party to the Paris Convention (since 1975), but not to the Oslo Convention. The original Paris Convention did not cover atmospheric transport.

The central obligations of the Paris Convention are extensive in that—in addition to general obligations—it speaks of the undertaking "to eliminate, if necessary by stages, pollution of the maritime area from land-based sources by substances listed in Part I of Annex A" and "to limit strictly pollution of the maritime area from land-based sources by substances listed in Part II of Annex A."[5] However, the Convention did not define "pollution" (which can be taken to include the notion of harm), so that this was not equivalent to a zero-discharge obligation, at least not according to initial interpretations of the Convention.

Institutionally, both conventions have been closely allied since their adoption and entry into force. The two commissions were collocated in London. In 1986, they were merged, even though the two conventions continued to have independent legal existence. In September 1992, the parties adopted a new Paris Convention, which effectively merged and strengthened the two previously existing institutions.[6]

The development of the North Sea regime is marked by several important events, including the increasing focus of researchers on the condition of the North Sea, the emergence of strongly articulated public opinion, and the increasing involvement of ministerial-level policymakers.

Like the Great Lakes in North America, the North Sea has become the focus of more intensive research than other ecosystems in Europe. The reasons are largely the same: Pollutants are transported by water and air towards the North Sea, which provides an ecosystem in which more persistent pollutants reside for longer times and can accumulate through the food chain.

It took several decades for these facts to be widely recognized. In particular, the wetlands along the southern shore of the North Sea (the coast of the Netherlands, Germany, and Denmark) became the focus of attention. The first major research assessment of environmental problems of the North Sea was undertaken by the German Council of Experts on the Environment in 1978. While this did not have any immediate policy consequences, this assessment can be viewed as the starting point of the transformation of the regime. From this time on, significant research on environmental problems of the North Sea was undertaken on an almost continuous basis. This did not lead to a coherent research community, however, presumably because the number of countries involved was relatively large and no strong linguistic link existed. The Netherlands and Germany were the principal countries supporting this research, so that much of it was published in German and consequently saw relatively limited circulation. No formal structure of cooperation emerged, either linked to the North Sea regime or independent of it.

In the early eighties, environmental organizations along the coast of the Netherlands, Germany, and Denmark became increasingly active. Their activities were initially financed with German resources managed by the highly effective and activist Dutch Wadden Association (Waddenvereniging). This activity attracted additional finacial support for locally based organizations with close ties to public authority. By the mid-eighties, discretionary funds available to the Greens once they entered the German Bundestag were being devoted to the North Sea. While the researchers provided the essential scientific basis for more vigorous action within the regime, the political dynamic was largely defined by locally based but internationally cooperating environmental groups. This ultimately led to a series of Ministerial Conferences on the North Sea—not provided for by the underlying Treaties and nominally independent of the regime—that became the vehicle for responding to scientific and public concern by a significant strengthening of the regime. It is notable that the institutions originally created were clearly not adequate for this task, because they reflected traditional concepts of international relations rather than the kind of direct action by those politically responsible that grew out of the ministerial conferences.

In the late eighties, a number of environmental events, in particular the mysterious death of large numbers of seals along the coasts of the North Sea, were attributed to pollution and gave a sense of urgency to the further development of the regime. The key

decisions were announced at the Third North Sea Conference in 1986, including a significant modification of U.K. domestic environmental policy to accommodate demands for further international action.

For ten years, ever since the U.K. joined the European Community (EC), a conflict over water management had persisted between the United Kingdom and other members of the EC. EC water management had largely been defined in reference to the needs for managing water quality in the Rhine River basin. After all, until the United Kingdom, Denmark, and Ireland joined in 1976, five out of six EC member states were located within the Rhine River basin (Italy being the exception and Austria the only Rhine River state not a member of the EC, but minimally affected or impacting water quality of the Rhine in its critical lower reaches). The EC approach was largely determined by the impossibility of assigning the limited receiving capacity for emissions into the Rhine among claimants. Consequently, satisfactory water quality was difficult to achieve, even when stringent emission values were imposed. The riparian jurisdictions, in particular the German Länder, which had a decisive voice in the matter, preferred a water management approach based on uniform emission standards rather than focusing on water quality itself. The United Kingdom has short, swift-flowing rivers, and many emissions to water go directly into the ocean or into estuaries that are subject to strong tidal action. Consequently, stringent water quality standards were relatively easy to meet, even close to major emission sources with little or no treatment (particularly of domestic sewage). The United Kingdom viewed the application of uniform emission standards as unnecessary to achieve adequate environmental quality in its rivers and coastal waters. Through the North Sea conferences (and a long process of discussion and negotiation), the U.K. recognized and accepted that certain hazardous or persistent chemicals can be transported over long distances and can accumulated, and that consequently stringent emission standards are justified for all emissions even if they are not needed for local water quality because the pollutants are rapidly transported away.

The result of these developments has been the emergence of a new regime, involving more stringent legal requirements, a much more public process for determining necessary policies and ensuring accountability, and a significant level of public participation. It may be going too far to speak of a "North Sea community," because several countries, in particular the United Kingdom, Belgium, France, and Norway that are important members of the North Sea regime are in fact affected by environmental quality of the North Sea to a much lesser degree than the Netherlands, Germany, and Denmark. Consequently, to the extent that a community exists, it is focused on these countries, with individual participants from the other countries, depending on the issues and the circumstances. Moreover, few mechanisms exist for continuous cooperation between nongovernmental interests in the regime, whether industry or environmental organizations. For many of the national organizations, the North Sea, while important, is but one among a number of leading environmental issues and is not consistently a major focus of attention or forum for the development of important policy themes. In most instances, purely national fora or the European Union will tend to be preferred.

1.2. The Baltic Sea

The Baltic Sea is an enclosed body of marine water, deep in parts but with large areas of modest depth and important wetlands along the southern coast. It is surrounded by industrialized countries, including the Scandinavian countries with the longest history of strong environmental concern; Germany, which embraced environmental policy energetically in the early eighties; and several important countries that were formerly part of the Soviet block in Eastern Europe. The Baltic basin reaches far north and south to the Carpathian Mountains. It includes some of the most notorious pollution sources on the planet, involving not only domestic wastes but a wide range of heavy metals and persistent industrial chemicals as well. At the same time, some of the few remaining natural areas of

Europe are found in the Baltic basin, including northern Scandinavia, northeastern Poland, the border regions between Poland, Ukraine, and Moldava, and the higher reaches of the Carpathians.

The need for international cooperation to protect the Baltic has been manifest for several decades. This need originally led to a treaty, signed in 1972 and modeled largely on the Oslo Convention, with a secretariat in Helsinki. Like the original Oslo Convention, the Baltic treaty focused on activities on the sea; that is, incineration and dumping of wastes. It left the real (land-based) sources of pollution of the Baltic untouched.

The Helsinki Commission, established by the treaty and served by its own secretariat, was composed of government officials from the riparian states. It neither held public meetings nor, for many years, published reports on the problems of the Baltic or on measures adopted to address them. Its activities were essentially secret, reflecting the desire of the representatives of countries with centrally planned economies to avoid public discussion of environmental issues but also largely unopposed by the representatives of the other parties.[7] Consequently, nothing verifiable is known about the activities of the Commission throughout the seventies and eighties. Certainly the Baltic benefited indirectly from steady improvements in the environmental performance of the Western European countries, including reductions in direct emissions to water and atmospheric loadings of critical pollutants. No evidence exists, however, that any of these measures were adopted specifically to benefit the Baltic or reflected any actions by the Helsinki Commission. By the late eighties, a situation had been reached where the quality of air and coastal waters in Sweden could be improved more effectively and economically by measures adopted in other riparian states, and in Poland in particular, than by anything the Swedish government could undertake—despite the dilution and dispersion of pollutants during environmental transport.

The Baltic regime did not give rise to a significant increase in research efforts, nor did it contribute to the emergence of an international community of scholars whose primary concern was Baltic environmental issues. Much of the research in the region was derivative of findings in the North Sea and elsewhere, applied to the Baltic; much of this research remained unpublished and not subject to rigorous peer review.

The situation of the Helsinki Commission changed dramatically with the transition of Poland, Russia, and the other riparian states to more democratic forms of government. The relationship of the new regimes in Eastern Europe to environmental affairs is problematic. The overthrow of the Soviet empire was an uprising of civil society against an insensitive technocratic system. The phenomenon of a regime crumbling from within is almost without precedent and has consequently been difficult to grasp in categories almost entirely defined by notions of military and economic competition. Environmental concerns were central to this civil uprising: In all countries of Eastern Europe, environmental organizations were deeply involved in the changes and in some (Hungary and Bulgaria), they were actually the proximate cause of change. The new regimes consequently owed some allegiance to environmental interests. At the same time, they were receiving deeply contradictory signals from Western governments and experts. On the one hand, most economic advice took scant notice of environmental concerns. On the other hand, the official position of Western governments—and of multilateral agencies such as the World Bank or the European Bank for Reconstruction and Development—was to pressure the newly democratic regimes to act decisively to protect the environment. Since key policymakers in the new governments had been trained mostly under the system that had created what was arguably the most severe environmental degradation ever seen on this planet, their actions showed a good deal of hesitancy about the adoption of stringent environmental measures.

The Baltic regime reflects most of these contradictory pressures. In the past seven years, it has opened dramatically and a significant international community of environmental concern has emerged, relating to but independent of the Helsinki Commission. The Baltic regime, encompassing both Eastern and Western countries, became an important vehicle for cooperation, since a mutually recognized goal existed to

justify joint action: protection of the Baltic environment. In particular, Swedish and German as well as international environmental organizations became active in promoting the development of an environmental awareness and the beginnings of an environmental movement in the Baltic region. This activity was supported by significant financial commitments from several governments for the development of essential environmental infrastructure, in particular when this involved the participation of key environmental service industries from the respective countries.

It remains difficult to assess the condition of the Baltic ecosystem, since systematic research is still at early stages. Certainly the restructuring of the economies of Eastern Europe provides several immediate environmental benefits. The general contraction of economic activity in the region has been accompanied by a reduction in emissions of all kinds. As scrutiny of environmental performance of major sources of pollution increased, a number of no-cost measures were adopted that have also reduced emissions. At the same time, investment in environmental infrastructure has increased rapidly, albeit from a painfully low level, and by now also contributes to emission reductions. All of these factors together have contributed to a reduction in short-term pressures, essentially gaining several years' respite. Hovever, economic restructuring has put in place structures that threaten to increase pressures on the sensitive Baltic ecosystem. As output rises again, there are risks that it will also lead to rising emissions. As Western patterns of consumption spread, the waste stream may increasingly include materials liable to cause harm unless disposed in a much more meticulous manner than currently appears possible in the region. And as previously untouched regions become more accessible through improvements in transport infrastructure, pressures from tourism and the movement of goods are also liable to increase.

The Baltic Convention has recently been revised along lines that mirror developments in the North Sea regime.

2. A New Regime

2.1 The Mediterranean

The Mediterranean probably represents the most daunting long-term environmental challenge of all aquatic ecosystems. Its very size will long hide many of the more serious problems, but also serve to make them all the more intractable once they emerge. More than 100 million people live in the Mediterranean basin year-round. They are divided among twenty-two countries, many of which have waged war against each other within living memory. Every year, they are joined by millions of vacationers seeking beaches and sunshine. All the countries, with the exception of parts of Italy, are fundamentally rural in nature, and depend on agriculture for their livelihood. Except for Italy, Spain, and France, industrialization has not yet proceeded very far. Consequently, the principal pollutants reaching the basin via direct discharge, rivers, and indirect runoff are those associated with human settlement and agriculture. The extent of atmospheric deposition from outside the basin is not known.

The Mediterranean has also traditionally been important for ocean transport of large amounts of oil in addition to traditional commerce.

To all intents and purposes, the Mediterranean is a closed system, depending on evaporation and precipitation and a modest inflow through the straits of Gibraltar to maintain balance. The residence time of pollutants is equal to the time required for environmental degradation.

The Mediterranean regime was established in 1976 through the Barcelona Convention, the first of the "Regional Seas" conventions sponsored by the United Nations Environment Programme. These largely reflect the pattern of the original North Sea regime: a traditional intergovernmental treaty containing general obligations but few specific

obligations, supplemented by protocols addressing specific issues such as waste disposal at sea, accidents or—in rare cases—land-based pollution. For most of these regional seas, land-based pollution is the dominant source of environmental degradation. A small secretariat manages the intergovernmental process and, in the case of the Barcelona regime, modest research funds that have been committed to the issue.

The first years of the Barcelona regime were occupied with arguments about financing, management, and the location of the secretariat. Achieving agreement between the twenty-two parties represented a remarkable achievement, since Israel and the Arab states had no other formal avenues of cooperation or communication at the time. The Barcelona regime is characterized by extreme diversity among the parties. The countries of the European Union (Spain, France, Italy, Greece) form a dominant block that provides most of the financial resources (in addition to a large proportion of the pollutants). The Arab countries represent a second grouping, with the island states (Turkey and Israel) completing the complex pattern. No other regional environmental regime involves a comparable diversity of developed and developing countries, with the exception of the essentially inoperable Caribbean one. Several of the countries continue to experience high levels of population growth and now have a population structure that ensures that such growth will continue at least twenty-five years into the future. Consequently, population pressures on the Mediterranean are sure to continue to mount.

The first priority for the Mediterranean was the construction of basic wastewater treatment facilities that were lacking in all countries, including France. Spain subsequently joined the European Union and, like Italy, feels some pressure to maintain basic standards of marine water quality in the interests of its tourist industry. Some progress has been made elsewhere, helped in part by the fortuitous circumstance of the Camp David Agreements that led to peace between Israel and Egypt. According to these agreements, Egypt is to receive the same level of U.S. funding assistance as Israel. As a result, these two countries now dominate the disbursements from US development assistance programs. While funding needs for Israel are long established, appropriate programs are needed to ensure financial flows for peaceful purposes to Egypt. As a result, U.S. development assistance has been funding the construction of a water supply and wastewater treatment infrastructure in Egypt.

The Barcelona regime has also created a forum for cooperation between researchers and experts in the member states. In many of these countries, persons concerned with wastewater treatment in coastal areas were typically isolated within their own communities, since their activities were not considered a government priority. The international regime was largely missing within their own countries, even in many instances for those from EU member states. The result has been the development of a community of scientists and experts within public institutions, related to the regime.

Public and media concern about the Mediterranean has sometimes been more strongly articulated in the northern countries, from which most tourists come, than in the riparian states with their predominantly rural and agricultural population. This contributed to the willingness of all countries of the EU to contribute to the management of the regime, particularly when a range of Mediterranean concerns were linked with action on acid rain, an issue primarily afflicting the northern countries of the EU at the time. There is little evidence, however, of public involvement in the regime, which has proceeded to evolve as an expert intergovernmental regime.

Just as the North Sea and the Baltic regimes evolved to embrace a broader approach and in particular to take account of land based sources of pollution, the Mediterranean regime has adopted in May 1995.

2.2 Issues for the Great Lakes

When compared with the Great Lakes regime, the experience of the three major European regimes offer a number of fairly clear conclusions concerning the role of science, public

participation, the relationship between officials and politically responsible actors, organizational issues, and the need for a dynamic regime.

Science

Research is essential for international environmental regimes. Without adequate research, it is neither possible to form an appropriate regime nor to adapt it to changing conditions over time. The three European regimes indicate that some research results can be transferred between regimes, but in general it is necessary to ensure that regime-specific research is undertaken. The environmental problems of the three regimes are largely comparable, deriving from land-based pollution (particularly heavy metals and persistent organic substances) and concentrated in coastal areas. This realization certainly accelerates and focuses the formulation of research agendas. Nevertheless, specific environmental conditions are sufficiently different from one region to another to require adaptation of the research. Results can differ significantly from place to place and over time.

In addition to providing essential information for regime formation and management, the existence of adequate research creates a significant bond between researchers from different jurisdictions. The fact that they are less likely to respond to specific political circumstances and more likely to identify with common ecosystem values provides a vital check on the political process and creates a first layer of support for the regime within each country. While researchers generally will not and cannot engage in political action, the existence of respected scientists in a given country, preferably in each affected country, provides policy-makers with reassurance concerning the necessity of envisaged measures and helps to ensure that the scientific basis is generally recognized as reasonable.

As is well known, environmental research contributes to problem definition but only rarely provides unambiguous results that can lead directly to political action. The process of interpreting research results for policy purposes is as important as the research itself. It is only rarely undertaken within the three regimes, largely because they do not have the necessary resources or expertise to undertake such a task. A number of alternate fora appear to have developed, frequently under the authority of politically responsible representatives of affected countries, to review and assess the available scientific information in light of the need for possible action. Such ad hoc arrangments carry a number of important risks, both from a scientific and a political perspective.

Public Participation

Significant differences exist in the levels of public participation in the three European regimes. The Barcelona regime has almost no participation; the Baltic regime has recently acquired mechanisms for public participation; and the North Sea regime was transformed largely by a combination of research and public pressure but has relative limited forms of continuous cooperation and participation. The experience of all three regimes suggests strongly that purely intergovernmental regimes, such as existed initially in all three regions, have a poor record of implementing environmental mandates. In practice, there are few mechanisms to push participants further than they might otherwise have gone, and in the absence of public pressures, civil servants will be extremely hesitant to put real pressure on their counterparts and will not feel free to use international fora as a means for advancing issues of domestic policy.

The question arises whether the regimes should be more active in organizing or at least fostering nongovernmental participation. Where research is concerned—generally a "nongovernmental" activity, even if carried out by government-financed institutions—the regimes clearly need to accept responsibility for the articulation of a regime-specific research agenda. Where industry representatives and environmental organizations are concerned, it is probably appropriate to let these determine the necessity and extent of cooperation by themselves but to indicate willingness to provide liberal access to

information, even in formative stages of policy processes, and to consult interested parties. The fourth major nongovernmental group, the media, are liable to follow the lead of the other three: research, industry, and environmental organizations.

Public Officials and Politically Responsible Actors

A striking common characteristic of the three European regimes is the importance of active participation by politically responsible representatives of the countries involved, rather than by high-level officials. This corresponds to widespread experience: Without a clear mandate from those politically responsible, even high-level officials from several countries rarely are able to develop strong, dynamic international regimes. Environmental regimes typically require step-by-step development to reflect changes in understanding of environmental phenomena and in shifting priorities for action. Such changes can be brought only about if those politically responsible are actively involved.

Organizational Issues

The three European regimes show three different organizational responses to a similar issue; the Great Lakes regime represents a fourth.

The North Sea regime originally had two commissions that were collocated; these have now been unified. The regime is almost entirely within the European Union (of all members, only Norway is not also a member of the EU), and the relationship between it and the European institutions has been a matter of continuing difficulty. Since the original regime clearly had inadequate means of restructuring itself, the environmental ministers of the countries involved created a new institution, the Conference of North Sea Ministers, which has subsequently been integrated into the regime structure.

The Baltic regime has a long-standing commission. Much of its institutional dynamic has apparently been carried over from the North Sea regime by the countries involved in both. The innovations of the new North Sea treaty have also been incorporated in the Baltic regime. The secretariat is, however, a free-standing international organization.

The Mediterranean regime has an independent secretariat that is administered by the United Nations Environment Programme, which maintains its Regional Seas Programme alongside the secretariat. The result is a very complex structure, which appears neither to have helped nor to have hindered developments in a regime characterized by slow development on account of the diversity of its membership and the nature of the issues it confronts.

There are no obvious conclusions to be drawn from this diversity except that it is difficult to address issues of water quality without reference to broader issues of economic policy. For many countries, water management can be equivalent to an industrial policy, particularly where water is scarce and needs to be reused several times, as is the case in several of the river basins that empty into the European regimes. It is important to ensure that whatever regime emerges has the means to address necessary matters of economic policy.

Need for Dynamic Change in a Regime

Perhaps the most important observation to emerge from this brief consideration of the three European regimes in comparison to the Great Lakes regime is the simple fact that no regime was capable of identifying and addressing all critical environmental issues in a single step. Depending on how individual steps are defined, each of the European regimes has in fact gone through several stages of development, in some instances already as many as five, if all protocols, amendments, and treaty revisions are included. There is no reason to assume that this process has been completed, just as there is little reason to assume that it has been completed in the Great Lakes regime. Given this fact, perhaps the most important

characteristic to look for in a successful international regime for water management is a capability to adapt and transform itself dynamically, extending even to the creation of new institutions and the introduction of additional procedures and participants into the process.

NOTES TO APPENDIX 5

[1] Data from Peter H. Gleick, ed., *Water in Crisis. A Guide to the World's Fresh Water Resources* (New York: Oxford University Press, 1993), Tables I.4–I.7, pp. 436–39.

[2] Stephen C. McCaffrey, "Water, Politics, and International Law," in Gleick, ed., *Water in Crisis,* p. 92.

[3] Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, February 15, 1972, 11 ILM 262 (1972).

[4] Convention for the Prevention of Marine Pollution from Land-Based Sources, July 4, 1974, 13 ILM 352 (1974).

[5] Part I lists mercury and mercury compounds, cadmium and cadmium compounds, persistent synthetic material that may float, remain in suspension or sink, and that may seriously interfere with any legitimate use of the sea; and persistent hydrocarbons of petroleum origin. Part II lists elemental phosphorus, non-persistent oils and hydrocarbons of petroleum origin, arsenic, chromium, copper, lead, nickel, zinc and their compounds; and substances that have been agreed by the Commission as having a detrimental effect on the taste and/or smell of products derived from the marine environment for human consumption.

[6] Convention on the Protection of the Environment of the North-East Atlantic.

[7] In 1978, the author attempted to obtain basic information on the activities of the Helsinki Commission from German government authorities and was refused any materials.